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The American Journal of Pharmacy

SINCE 1825

A RECORD OF THE PROGRESS OF PHARMACY AND THE ALLIED SCIENCES

CENTENARY NUMBER

DECEMBER

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AMERICAN JOURNAL *of* PHARMACY

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Vol. 97 DECEMBER, 1925 No. 12

CONTENTS

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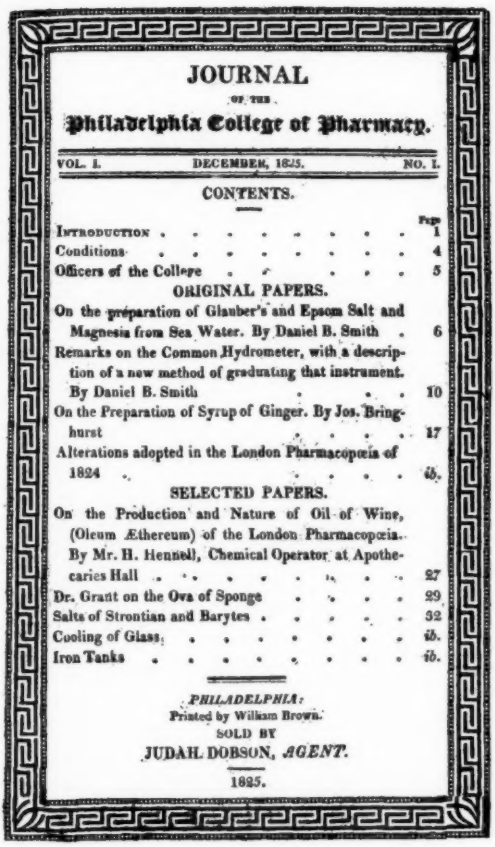
EDITORIAL



JOURNAL
OF THE
Philadelphia College of Pharmacy.

VOL. I. DECEMBER, 1825. NO. I.

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1825.

THE SECOND CENTURY

WITH this issue the AMERICAN JOURNAL OF PHARMACY celebrates its one-hundredth birthday anniversary. In the whole world there is no other such journal that can glorify in a century of service. For throughout its existence it has kept faith in the art and science of pharmacy. It was the beacon light of professional pharmacy in 1825. One hundred years later its light shines just as clearly. All through its life it has been financially and otherwise supported by the Philadelphia College of Pharmacy and Science—as one of the many contributions of that venerable institution toward the cause of pharmacy and the allied sciences.

Founded in the serious-minded days of Quaker Philadelphia—it carries to this time, marks of its early training. For no one can deny its stolid dignity—nor feel that it has at any time belied its conservative inheritance.

When a man lives beyond the century mark it is considered a great achievement. Generally it is, for only a healthy heredity and a genius for wholesome living can account for such a lifespan. When the centenarian is asked to account for his longevity usually he answers that it is temperate habits—no smoking—no drinking—no over-indulgence in anything except clean thinking and clean living.

Likewise the JOURNAL might well account for its first century—in that it has never smoked the pipe of sensationalism—nor touched the cup of intemperate spirit, but that its whole lifetime has been spent honorably fulfilling its mission as a "Record of the Progress of Pharmacy and the Allied Sciences."

Only the simile falls short in that, with the centenarian, passing the threshold of the century is sure earnest of an early grave, whereas with the JOURNAL there is every hope for its prosperous and useful continuance and no thought of its end.

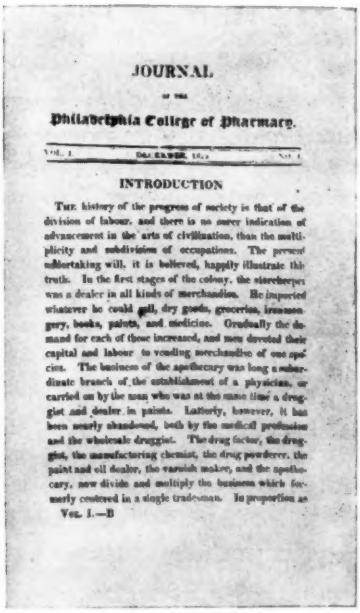
At one time during its existence the JOURNAL was the lone herald of American pharmacy—and in those days American pharmacy mothered many another then frail infant science. Botany, chemistry, bacteriology, biology—were all too young, much too meagre-minded to care for a separate existence. But since then they have all grown up—and in their prosperity they have almost forgotten the calling that mothered them.

In those early days when there was this commingling of interests it is not surprising to find the JOURNAL recording the articles of men like Pasteur, the genius of Arbois; Becquerel, the great apostle of the electro-chemical sciences; Claude Bernarde, the founder of the endocrine school; Berthelot, the great chemist; Berzelius, the wizard of chemical arrangement; Bessemer, of steel fame; Bonjean and his ergotin; Boullay, *pere et fils,* the originators of percolation. Indeed the list of early contributors to the JOURNAL is a cross section of the elite of the sciences in that day and generation, not only in America, but throughout the world of learning. Read this record of immortal names taken from the pages of its earliest volumes—and know thereby the proud heritage of this little book, that has held inviolate to its altruistic purpose, and has weathered all the successes and all the vicissitudes of an ever-changing trail of years in a long, long century. How large a share of work fell to these pioneers in American science, and how well their works endure.

Hare, Bache, Wood and Procter, Carson, Egglesfield Griffith, Daniel Smith, Bullock, Diehl, Dohme, Duhamel, Durand, Ebert, Ellis,

Garrigues, Hancock, Jackson, Maisch, Mayer, Agassiz, Parrish, Powers, Remington, Rosengarten, Scattergood, Leidy, Shinn, Squibb, Stearns, Taylor, Turnpenny, Ure, Warner, Weigand, Wormley and Wyeth. What a healthy American ring is even in the mention of their names—and what an impress was left by their honest Quaker works.

Nor was the JOURNAL ever restricted to domestic contributors, as this list of foreign users of its pages will prove: Attfield, Jacob Bell, Biot, Boettger, Braconnot, Buchner, Bunsen, Kirchhoff, Berthold, Bussy, Cahours, Caventou, Chevreul, Dragendorff, Duhamel, Dumas, Faraday, Fehling, Flueckiger, Frankland, Fresenius, Gay-Lussac, Gmelin, Asa Gray, Greenish, Guyot, Hager, Hahnemann, Hanbury, Henry, Pelletier, Derosne, Labarraque, Leblanc, Leibig, Leibrich, Magendie, Merck, Millon, Nativelle, Orfila, Payen, Perot, Pettenkofer, Quevenne, Redwood, Robiquet, Sobberian, Stas, Thénard, Trommsdorff, Vauquelin, Winckler and Woehler.



JOURNAL
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INTRODUCTION

THE history of the progress of society is that of the division of labour, and there is no surer indication of advancement in the arts of civilization, than the multiplicity and subdivision of occupations. The present undertaking will, it is believed, happily illustrate this truth. In the first stages of the colony, the storekeeper was a dealer in all kinds of merchandize. He imported whatever he could sell, dry goods, groceries, ironmongery, books, paints, and medicine. Gradually the demand for each of these increased, and men devoted their capital and labour to vending merchandize of one species. The business of the apothecary was long a subordinate branch of the establishment of a physician, or carried on by the man who was at the same time a druggist and dealer in paints. Latterly, however, it has been nearly abandoned, both by the medical profession and the wholesale druggist. The drug factor, the druggist, the manufacturing chemist, the drug powderer, the paint and oil dealer, the varnish maker, and the apothecary, now divide and multiply the business which formerly centered in a single tradesman. In proportion as

VOL. I.—B

Truly it is a recital of the names of the fathers of the modern sciences.

It is of the past we have spoken—of the days before the whirlwind—when men built edifices designed to last.

In this, our generation, speed and specialization prevail—sentiment develops mostly about the present rather than about the past and art is higher than science.

But the JOURNAL has outlasted the fads of other generations—and today it stands on the pinnacle of its first century, properly proud of its honorable past and supremely confident of an equally honorable future.

On a November evening in the year 1825, Daniel Smith, the first Editor—in his methodical, meticulous, Quaker way—wrote the following paragraph as the finishing touch to his introductory editorial

for the first issue of a new journal. And the concluding paragraph is always the most difficult of the whole editorial. But this Quaker gentleman wrote with such quaintness of phrase and modesty of spirit that the Editor, whose delightful privilege it is to write the first editorial of the second century, borrows this concluding sentiment from the kindly Daniel Smith—

"Should the JOURNAL *of the Philadelphia College of Pharmacy contribute to these results by awakening and fostering a spirit of research and experiment, although labouring in an obscure and humble portion of the vineyard of science, it will reap rewards honourable to its contributors, and useful to the world at large."*

IVOR GRIFFITH.

ST. LOUIS COLLEGE OF PHARMACY
2108-2110 Locust Street
St. Louis.

November 13, 1925.

American Journal of Pharmacy,
Philadelphia, Pa.

Dear Editor Griffith:—

So the American Journal of Pharmacy is a century old and has a history reaching back practically as far as the United States Pharmacopœia.

I first became acquainted with the Journal in 1877. I was a high school student working in a drug store, evenings, Saturdays and Sundays. The proprietor was a physician, graduated by the College of Physicians and Surgeons of Edinburgh. He belonged to the old, old school and read the best literature obtainable relating to medicine and was equally particular about pharmaceutical literature.

The American Journal of Pharmacy reached him regularly. He also had Procter's Lectures on Pharmacy and in his fatherly way endeavored to impress upon my mind the value of reading the best and most reliable literature pertaining to what I had determined to make my calling, pharmacy.

I congratulate the Journal on its long and useful career which has been ever true to the best interests of pharmacy.

I also congratulate the Journal on having an editor who gives scientific and professional information in a very palatable form.

Very truly,

HENRY M. WHELPLEY, *Dean,*
St. Louis College of Pharmacy.
H. M. W.

THEN AND NOW

THE AMERICAN JOURNAL OF PHARMACY has reached the venerable age of the centenarian. For a full one hundred years it has faithfully recorded for its readers the progress of science in a broad, yet well-defined field.

A hundred years present a long, long vista, reaching back to an unfamiliar age, and to unfamiliar conditions of life. The type of the early issues of the JOURNAL was set by hand, from handwritten manuscripts, and the proofs were read by candlelight, or by the light of a sperm oil lamp. The creature comforts, and the labor-saving devices to which we are accustomed, and without which existence now hardly seems possible, had not yet come to be. As we strive to visualize the first editor at work, his readers in their proper setting, and the conditions under which they lived and labored, the fact is brought home to us that life, at that time, was exceedingly primitive and correspondingly arduous. We feel that we, in comparison, are singularly fortunate, fortunate in the enjoyment of many advantages of which the first editor and his readers, had not so much as the faintest conception.

'Tis a pity, however, that the modern complexity of life tends to rob us of our leisure. We lack time to read, time to think, time to perform without undue haste, all the innumerable tasks which crowd upon us. Modern life is full, full to the brim.

In that more leisurely age when the first editor determined upon the policy and character of this, the oldest publication of American pharmacy, the appearance of a new issue was an event. Each number was read, re-read, and then carefully preserved, for at that time printed matter was scarce, and was prized accordingly. No need to bear in mind the reader with barely enough time to glance at the captions, or to dip into a paragraph here and there. Brief "digests," "reviews," hitting only the high spots, sugar-coated pellets of knowledge, compressed tablets of wisdom, pithy paragraphs of printed personals, printed in primer type, so that "he who runs may read," were not in vogue. The editor's task was clearly before him: to print the findings of research workers, and to record accurately, authoritatively, and with the graces of style at his command, the progress of pharmacy, and of the sciences which constitute the foundation stones of this art. A publication fashioned along these lines was—as we can see—attuned to the conditions and the needs of his day and age.

But this is quite another age, and the mutations of a hundred years could not be ignored. Again and again the JOURNAL has, in

certain respects, re-adjusted itself to the needs of the times, a fact which in no small measure accounts for its continued life, and its present-day position in the journalistic field. Thus it appears today, meeting the needs of the busy man who desires to keep in touch with new discoveries, and who appreciates a general survey of scientific progress;—supplying abstracts, excerpts, reviews, also science articles written in popular style—the equivalent of a university extension course for readers who desire to extend their mental horizon beyond the confines of their own special field. In short, our JOURNAL has been adapted to a larger clientele. It is interesting, readable, and in every sense modern.

And yet, a close inspection discloses that the editorial policy of its first editor has, in substance, been continued uninterruptedly to the present day. Indeed, it becomes evident that the developments of the JOURNAL have been in the nature of additions and not in the nature of displacements. Nothing has been permitted to crowd out original articles by research workers, the kind of matter which characterized the early numbers a hundred years ago. Thus the files of this publication have come to represent a full century of research, and for this reason they are now of inestimable value for reference purposes by present-day investigators. It is because of the original papers on researches that this JOURNAL, despite the tendencies of the times, is preserved, bound, and given a place on the shelves of libraries in educational institutions, in industrial establishments, and in the workshops of scientific pharmacists.

We are busy folks these days, it is true, and we like to cover as much ground as possible in the shortest period of time. So we welcome the newer innovations in our JOURNAL. But this applies rather to fields just outside our own special interests. In the case of these latter, neither abstracts nor surveys meet our needs: we must have the original articles, have them in full, with all the details. So we welcome the centenary numbers of this JOURNAL, attuned to modern needs, as it should be, yet maintaining the particular kind of service which characterized its initial numbers, a full century ago.

A larger group of readers will look forward to the next number with keen anticipation, because of the newer features. Its issues will be saved, given a permanent binding, and a place on the library shelf, because the editorial policy of the first editor, has, as to fundamentals, been continued without a break, through these many years.

The JOURNAL suited the times in 1825; it does now.

J. W. STURMER.

NEW LIGHTS FOR OLD

THE fact that white light is composed of all the visible colors has long been known and is familiar to most intelligent persons. It is not so generally known that a large number of radiations exist essentially identical with ordinary light, but invisible to human beings. Applying the generally received theory that light is due to extremely rapid vibrations (although physicists seem to be modifying their views on this point), the explanation of the invisibility is that some are too short and rapid and the others too slow and long for appreciation by the human retina. The short, rapid waves are termed ultra-violet, the slow, long ones are termed infra-red. Both types were discovered in the early part of the last century, but for many years almost nothing was done to develop their applications and properties. This was largely due to the lack of methods for producing them in efficient amount. The invention of simple and inexpensive methods of producing high tension electric discharges has enabled the construction of apparatus giving large volumes of ultra-violet radiation, and, in consequence, much research has been undertaken of recent years and many highly interesting facts obtained. Among these are:

(a) Injurious action of the rays upon the skin and human retina. Any appreciable exposure to them may result in blindness.

(b) Opaqueness of materials transparent to ordinary light to all but the radiations near to the violet, that is, the longest waves of the ultra-violet group. Most forms of glass, mica, even in very thin layers, celluloid, and water are practically opaque to the rays. Quartz and fluorite (calcium fluoride, commonly known as fluor-spar), transmit considerable ranges of the waves. A special glass having fair transparency is now available.

(c) A peculiar stimulative power on food substances and a special therapeutic effect has been noted with certain of the rays.

The last named property deserves some discussion. The data are set forth in much detail in a work recently issued by Ellis, Wells and Boehmer, of the Ellis Laboratories, Montclair, N. J. The book is a comprehensive presentation of the facts and methods in regard to ultra-violet radiation and deserves the attention of all physicists and chemists. The principal data concerning the therapeutic and dietetic value of the radiations is to be found in Chapter 14.

Powerful sources of the rays are used, principally the quartz-mercury lamp, which is now in the market in several convenient forms. Direct exposure of the skin for some time to the light from these apparatus results in superficial irritation, resembling sunburn, but this action is not comparable to the penetrating power of X-rays, although these latter are phases of the same vibrations, but much shorter than those emitted by the common ultra-violet apparatus. It is now stated that ordinary sunburn is due to the moderate amount of ultra-violet light that is present in full daylight, specifically under a clear sky. Concerning the most recently noted actions of the rays, namely, influence on the calcium and phosphorus metabolism, it will be best to make a summary from the book.

In 1920, Hess and Unger reported that rickets develops in children, notwithstanding abundance of fresh air, and liberal allowance of light in glass cubicles. These workers also failed, at first, to benefit rickets by ultra-violet radiation. They, therefore, expressed the opinion that these rays cannot replace sunlight (which they had previously found very beneficial for rickets). This unfavorable opinion they have apparently recanted since, in 1921, they spoke of their success in curing the disease with ultra-violet rays. The most sensational discovery is, however, that exposure to these rays will sometimes makes up for a deficiency of vitamin in a ration. How far such actions are due to emanations produced by the rays is at present not ascertained. Kugelmass and McQuarrie found that substances curative of rickets, on oxidation blacken sensitive plates through quartz, but not through glass. These results cannot be taken as final. Further careful experimenting must be done. It appears, however, from remarks made by Dr. Hess at a meeting January, 1925, in New York, that cod liver oil and ultra-violet radiation of a narrow range (wave length about 305 millionths of a millimeter) are both efficient in preventing rickets on a defective diet.

As glass does not pass the rays and quartz does, it is to be hoped that rapid progress will be made in cheapening the manufacture of the latter, so that cubicles of the material may be constructed for exposure under comfortable conditions to the ultra-violet radiations that are emitted somewhat abundantly by the clear sky, for it is thought that the similar rays from sun are too much scattered and absorbed before reaching the earth to be of much use.

Notwithstanding the amount of work that has been done, a large field of study is still available. It is to be hoped also that more attention will be given to infra-red rays. These are operative in wireless telegraphy and radio broadcasting. Some therapeutic action, principally pain assuaging has been ascribed to them, but a much closer study seems advisable.

HENRY LEFFMANN.

EDITORIAL OFFICE
AMERICAN DRUGGIST
53 PARK PLACE
New York, N. Y.

November 5, 1925.

145 North 10th St.,
Philadelphia, Pa.

Dear Professor Griffith:

I am in receipt of your announcement of November 4 relating to the forthcoming December issue of the AMERICAN JOURNAL OF PHARMACY, which practicaliy completes a full centenary of service by that publication.

It was in 1879 that I first became acquainted with the AMERICAN JOURNAL OF PHARMACY, therefore I cannot boast of knowing it during its entire life. But when I can claim an acquaintance of very nearly half that time, you must admit that I am competent to speak somewhat of the value of the publication. During the whole of my pharmaceutical life I have looked upon my file of the Journal as my most valuable reference source and consult it regularly, as also the volumes of Proceedings of the American Pharmaceutical Association. I can freely vouch for the truth of your assertion that the pages of the AMERICAN JOURNAL OF PHARMACY have always been kept clean both in its text matter and advertising department and that it is universally looked upon as a competent exponent of what is best in American pharmacy. It should be a source of considerable gratification to you that its destinies at this time are in your charge, and I am confident that in preparing your anniversary number you will accomplish the task with great fidelity and in all detail and completeness.

I wish you the best of luck both personally and as a brother editor.

Very sincerely yours,

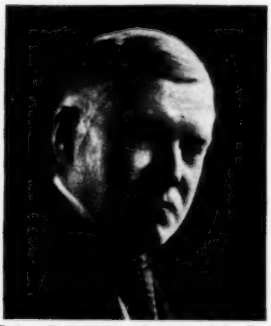
C. W. PARSONS,
Editor.

ORIGINAL ARTICLES

ONE HUNDRED YEARS OF PROGRESS*

By John Frederick Lewis, LL. D.

I GREATLY appreciate the honor of addressing you upon this distinguished occasion. It is distinguished by your presence, and the presence of the Faculty of the Philadelphia College of Pharmacy and Science, and it is especially distinguished by the presence of a large graduating class, which, notwithstanding the severe tests applied to them, have not reacted under the high standard of education the College requires—a standard equaled by few other institutions of its kind in the world, and excelled by none.



John Frederick Lewis, LL. D.

I am indeed grateful to this old and venerable institution, and speaking as a layman to layman, I am sure you are grateful also, for what it has done, and is continuing to do. Its work is vital to every member of the community, more so perhaps, than that of a mere college of arts and letters. Illness may attack the strongest among us, and when it does, while the forces marshalled to repel it, may have physicians and nurses leading the van, reliance must be placed in the last analysis, upon the chemist and pharmacist in the rear.

During the century this college has existed, its career has been one of marked progress. It has developed its course of instruction, raised its standard, increased its facilities, widened its sphere of usefulness, and opened its laboratories and class rooms to an ever-increasing number of students. They have come not only from this city and state, and from other cities and states, but also from this countries, whose young men and women are seeking the opportunities it affords.

Its progress reflects the extraordinary advance which has been made during that period throughout the world, and especially in this country, in political, scientific, industrial and even in domestic conditions.

*Commencement address, at the Academy of Music, June 10, 1925.

Let us look for a moment at that reflection. Doing so will give us a better understanding of the past and stronger hopes for the future.

Everything has been moving forward, and the advance still continues. We are living in a wonderful era, and if we fail to realize it, it is because we are so close to the rapidly moving picture which the age presents, that we cannot quite take in the entire story. The advance of civilization during the last century, and especially since the signing of the Declaration of Independence, whose one hundredth and fiftieth anniversary we are shortly to celebrate, has probably been greater than all the advance heretofore made since the dawn of human history. Great ideas have been born, and with the advent of the telegraph and the telephone, the words of the Psalmist have become literally true, "—their line has gone out into all the earth," and by the wireless transmitter: "Their words to the end of the world."

The greatest of these ideas is the self-evident truth that, "all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the Pursuit of Happiness, that to secure these rights Governments are instituted among Men, deriving their just powers from the consent of the Governed."

Political freedom was established. Not the freedom which was enjoyed under the Greek and Roman Republics, which was the mere freedom of a class, and under which the citizen existed for the government, but individual liberty, under which the government exists for the citizen. The authority to rule is now from the bottom upwards, not from the top down. With the spread of that great idea, came the abolition of slavery, which at the close of the eighteenth century was found almost everywhere: In Austria, in Prussia, in Scotland, in the British, French and Spanish colonies in North and South America, and during which hundreds of thousands of negroes were kidnapped, or bought, and carried across the Atlantic as personal chattels. In 1807, England led the world, when she abolished the slave trade.

Then arose the idea that human life was sacred. Its value was enhanced. The law of England at the beginning of the nineteenth century, probably the most highly civilized of its day, and our own priceless heritage, recognized over 200 crimes which could be punished by death. A man could be hanged for injuring a hedge; for the larceny of anything worth five shillings; for shooting rabbits

without authority; for returning without leave from overseas transportation; and even for writing a threatening letter to extort money. We accepted our English heritage, but we humanized it. American civilization corrected the errors of the past. A single century of life under independence, proved more effective in this respect, than the millennium which preceded it. As an Englishman, Joseph Hatton said: "Ten years in the history of America is half a century of European progress."

Among other great ideas the last century evolved, is the doctrine of honor to womanhood, which was followed by the emancipation of women; the duty to wounded in time of war, which was followed by the Geneva Convention and the establishment of the Red Cross; the liberality of thought which lead to the abolition of the Spanish Inquisition in 1808, and the disestablishment of the church, and which were followed by the freedom of religion. Hume's "Scepticism"; Kant's "Knowledge from Experience," and his "Critique of Pure Reason"; Darwin's "Natural Selection" and "Origin of Species"; Herbert Spencer's "Law and Cause of Progress"; and "Evolution, the General Recognition of the Fact that Truth is Truth, no Matter What it Conflicts With"; the "Rights of Man"; the interdependence of class upon class, the duty to one's neighbor, the knowledge that what helps the community helps the individual, which were followed by eugenics; social service, and civil service; public education; improved hospitals and trained nurses; better care of children; pure food laws; the evolution of industry; the factory system and factory inspection; the rise of municipalities and the vast development of the modern city; the increase in the number of corporations, and the rise of trusts; the control of railroads; the labor movement, shorter hours of labor, and other labor legislation; trades unions and strikes; Socialism; Communism; prison relief; savings banks; penny postage and buying and delivery by parcel post; sweeping reforms in the law; and daylight saving with its friends and enemies, and which if clocks are to be trusted, enables us to reach neighboring places before we started.

With the spread of personal liberty came liberty of thought, of speech, and of the press, the general dissemination of knowledge and control of public opinion by a vast output of books, magazines and newspapers. An immediate advance was made in every form of human activity. Discovery followed discovery in rapid succession, and invention invention. Science was applied to industry.

Beginning with agriculture which is the world's basis of all wealth, inventoin and science in this country worked amazing changes. It is hard to beleve that prior to the opening of the nineteenth century, 1820 to be exact, there was not an iron plow in all the world. Men scratched the ground with the root of a tree or with a wooden plow, in much the same way they had been doing throughout the nineteen centuries before it. Then came the iron and steel plow, with its nicely curved mold-board, which turned the sod in the furrow upside down and exposed the sub-soil to the vitalizing influence of the sun. Then came the riding plow to double the work of the day with half the labor. Then the traction engine to turn three furrows at once at three times the speed, and which can be followed simultaneously, with the harrow, the cultivator and the planter. Less than a century ago, the farmer harvested his grain with a scythe, then attached to it a cradle, then used a mowing machine, then a reaper and binder, and he can now reap, bind and thrash in one operation.

Agricultural chemistry arrived—one of the youngest of our sciences—but now accepted by millions of farmers as a familiar acquaintance. They speak of potash, phosphorus and nitrogen, and nitrogen gathering bacteria, as glibly as they call cows from pasture or chickens for feed. It has done more to increase the actual food supply of the world than any science in human ken.

Living conditions improved. Houses were better built, underdrained, fitted with running water, hot and cold, with bath tubs, those greatest of civilizers, sanitary plumbing, hot air, hot water and steam boilers for heating, using coal or fuel oil. The expectation of life was altered, and its average duration vastly increased.

The flint, steel and tinder box, which the fathers of many now living, used in starting a fire, were followed by friction matches, those with blue heads, which choked you, and those polite brown-headers called parlor matches, which did not, and the modern safeties which must be struck on the box. Candles and lard oil lamps were succeeded by kerosene. Gas was used for lighting, heating and cooking, Welsbach mantles invented; acetylene used for lighting and welding, electric lights constructed, arc and incandescent; electric irons, sweepers and washing machines; electric welders; and mercury vapor lights. Our forefathers would be astonished indeed, could they see us push a button and turn on the light, call a messenger, or start a burglar alarm. A few years ago when the President of the United

States was inaugurated, two thousand people might hear him, if fortunate enough to get a place on the steps of the Capitol, but when President Coolidge was inaugurated this year, his words, his accent, and even his voice tones, were within reach of probably fifty million people, while sitting comfortably in their own homes hundreds of miles away.

Probably the greatest betterment in our living conditions is to be found in the variety of our foods brought by rapid carriage, over land or water, or preserved by efficient canning or bottling. When my own father sailed from Philadelphia to Canton, China, in the forties, a voyage of six months' duration, salt meat and hardtack, after the potato supply had given out, were chiefly relied upon, and before the biscuits could be eaten the weevils were knocked out, and before the water was used, it was strained through a rag to get out the worms.

How vast a field invention has covered during the past century; the power loom, the cotton gin and the pattern loom, so that the virtuous woman no longer "layeth her hands to the spindle nor holdeth the distaff." The home spun stuffs of our ancestors are curiosities. The world's wool and flax, a little over a century ago, were made into yarn in the same primitive way used thousands of years before. The application of steam to manufacturing and transportation, produced changes impossible to recount. The human hand which formerly did all the work to be done, and did it badly, was succeeded by machinery. Steam power presses, steam hammers, steam cylinder presses, and linotype machines which have almost ended typesetting by hand; and typewritters, not those with bobbed hair, but the machines, which are relegating penmanship to the lost arts. Bessemer steel and open-hearth steel arrived; the sewing machine, and shoe sewing by machinery, vulcanized rubber with its endless uses and applications, from the tooth brush and gum shoe to the automobile tire; velocipedes, and bicycles; electro-dynamos, driven by steam power, replaced the little electric toys which a few years ago amused students in laboratories; daguerreotypes; wet plates, dry plates and the wide development of modern photography, lithography, the half-tone; and color printing, and if newspaper reports are true of the recent meeting of the American Bronchoscopic Society, photographs can now be taken of the inside of the stomach. Probably we will shortly be swallowing a cinema-camera, which will

navigate our alimentary canal, and take a moving picture of our entire department of the interior.

The advance in methods of traveling, has been greater than in probably any other field of human endeavor. It has utilized discoveries and inventions of the most varied character. A hundred and fifty years ago men traveled little, but when they went by land they were on foot, or in wagons or chariots drawn by horses or oxen, and in Oriental countries by camels or elephants, in the same way exactly as the Cæsars of Rome, or the Pharaohs of Egypt. When they went by water, they relied upon oars or sails, like the boats on the Nile, the Tigris, or the Euphrates, thousands of years before.

When Lord Campbell, at the close of the eighteenth century, accomplished the journey from London to Edinburgh by stage coach in three days and three nights, his friends warned him of the liability of his body to injury from the mere speed. As late as 1815, the news of Waterloo, carried with all possible prearranged details, required three days from Brussels to London. Seventy years later, when the English bombarded Alexandria, the news reached London a few minutes after the first shell was thrown. As late as 1850, traveling from New England to Oregon, required nearly eight months.

Man has learned how to create and harness motive power. Distant cities and states have been brought closer together than were neighboring villages of a single county, a century and a half ago, and foreign nations have been brought into closer contact than at any time before in the world's history. Oceans now connect countries rather than separate them, and are crossed at a speed hitherto undreamed of. Ideas are exchanged as well as merchandise, and the invention of the telegraph and its use with ocean cables, makes this interchange instantaneous, and our daily press gives us the current news from every part of the world.

Horse-drawn vehicles on country roads, have been supplanted by automobiles, and by locomotives on roads of steel, while steam, electricity and gasoline, are used as motive force. Air brakes, block signals, telegraph and telephone installations, have enabled the highest speeds with the greatest assurance of safety. We can read without astonishment in last month's news, that a girl of nineteen, carried an injured man by automobile from Egg Harbor to a Camden hospital, forty-five miles in thirty-eight minutes, while the way ahead of her was being cleared by a patrolman on a motorcycle.

Traveling by water has witnessed even greater changes. Oars and sails have been supplanted by steamboats, and John Fitch, of Philadelphia, it may be noted in passing, is entitled to the credit for first moving a boat by steam in this country. Then came the trans-Atlantic steamship. The American "Savannah," in 1838, was the first to cross the Atlantic with the aid of steam, for side wheels, as auxiliary to her sail power. Then the screw propeller was invented, then the compound marine engine, the twin screw, the quadruple expansion engine, the steam turbine and internal combustion engines, like the Deissel. Steam steering gear was invented, wireless telephones used by ships at sea, the gyroscope compass replaced the unsteady hand of the man at the helm, and radio compasses are now used, so that vessels equipped with direction finders, can get in touch with signal stations, and navigate through fog with confidence in their exact position obtained by the simple method of taking cross bearings. Ships communicate with each other, and with the land, and their movements in different parts of the world, are published weekly, so that the mystery of the sea is confined to works of fiction.

Who would have imagined, a century and a half ago, that the voyage which took Columbus sixty-nine days, in the "Santa Maria," and Bradford sixty-five in the "Mayflower," and which even at the beginning of the nineteenth century, often required sixty days, would be made by the "Lusitania," in five days and fifty-four minutes, and that the ships of 500 tons, would be succeeded by those of 10,000, 20,000, 30,000, 40,000 and finally 50,000 tons, and of such mighty strength that they could almost carry on deck their predecessors of a few generations before? To contrast the big with the little, we have just witnessed a gasoline launch, break the speed record between Albany and New York, drawing ahead of the "Twentieth Century Limited," and covering the distance in two hours and fifty-eight minutes.

It is a short span in time, though a long one in knowledge, between Mongolfier's hot air balloon of 1783, and the lighter than air dirigible, made in Germany, purchased by the United States for delivery in this country, and which sailed from Friedrichshaven to Bordeaux in fourteen hours, and from thence across the Atlantic via the Azores, without stop, to the Bay of Fundy, in eighty-one hours, and then without accident, sailed majestically over New York City, before safely mooring at Lakehurst.

Who would have believed a few years ago, that a heavier than air machine, would fly three hundred miles an hour, cross this same mighty ocean from Newfoundland to Ireland, in sixteen hours and twelve minutes; and our vast continent from New York to San Francisco, between daylight and dawn; that the United States would establish daily mail deliveries by air; that innumerable passenger routes by aeroplane would be operated continually in various parts of the world; that flying from London to Paris would be a commonplace trip; and that an aeroplane would leave San Monica, California, under the care of the United States Government, and fly completely around the world?

In warfare, the smooth-bore, muzzle-loading musket, with a range in feet, has been supplanted by breach-loading rifles with a range in yards, if not in miles; and smooth-bore cannon, by mighty breach-loading rifled guns, capable of throwing heavy projectiles fifty miles. The flint and powder pan, were followed by the percussion cap, and then by the fulminating cartridge. We have smokeless powder, nitro-glycerine, dynamite, T. N. T., gun cotton, poison gas and tear gas. We have learned the art of digging in, which General Jackson first used behind the cotton bales, when he repulsed the British at New Orleans. Bombs are thrown from the ground and dropped from the air. Torpedoes are shot on the water and underneath it, carried by aeroplanes, and steered by wireless apparatus, and claims have been made that death rays are in process of invention.

Among the important events which our age, or its immediate predecessor, witnessed following the American Revolution were: The French Revolution with its gross excesses, the Reign of Terror; the rise of Napoleon and his subjugation of almost all of Europe, the War of 1812 and the freedom of the seas, Napoleon's Fall at Waterloo; and after several attempts and failures at government, the final establishment of the French Republic; the publication of the Monroe Doctrine, and of almost equal importance, the publication of "Uncle Tom's Cabin"; the execution of John Brown, the election of Abraham Lincoln to the presidency; the secession of the South; the American Civil War, the emancipation of the slaves, the Battle of Gettysburg, the surrender of Lee, the reconstruction of the South; the vast extension of United States territory—Louisiana, Alaska, Florida, California, Texas, and former Mexican soil, the discovery of coal in Pennsylvania and gold in California; the digging of the

Erie Canal; the irrigation of the dry lands of the West; the national bank system, and the adoption of a protective tariff; the mighty strides during the wonderful age of Queen Victoria; the Franco-Prussian War; the triumph of nationalism in Germany and in Italy; the partition of Africa, the disruption of the Ottoman Empire and the rise of the Balkan States, our Spanish-American War, free Cuba, the acquisition of the Philippines; the establishment of the Irish Free State, and republics in Europe, and even in Asia, which seem to evidence the passing of monarchy as a form of government.

We have witnessed the greatest war in the history of the world, one which started from a comparatively insignificant event—the murder of an Austrian Archduke—but the struggle which followed was not merely that of rulers with their armies, but one in which entire nations were engaged, the bitterest conflict the world has ever known, and which before its close, extended to almost every civilized nation on earth from the little Republic of Andorra in North Spain, which raised nine men for the fight, to several mighty empires, which did not stop at raising over 900,000.

England sent a mission to this country, to beseech the help of her former colony, and over a million men answered her plea and crossed 3000 miles of ocean to fight for democratic rule.

We could hardly have imagined a century ago, that notwithstanding the most rigorous blockade England and France could maintain, a German submarine would cross the Atlantic and deliver dyestuffs to our ports, and that after America itself had entered the war, and the blockade had become more rigorous, would again cross the Atlantic, mine our ports, and sink a steamship—the "Herbert L. Pratt"—at the Capes of the Delaware.

We have seen a statue of Abraham Lincoln unveiled in London, and the Stars and Stripes floating over the Houses of Parliament, and America Day celebrated in Paris as a token of gratitude, with that same flag flying from the Eiffel Tower. Our Government floated a loan of $2,000,000,000 at 3½ per cent. interest, and as soon as it was offered to our citizens, it was oversubscribed, and further loans of greater magnitude were taken almost as promptly.

We have seen our people put under compulsory military service; the railroads of the country taken over and operated by the Government at Washington; fuel administrations created, which regulated the quantity and quality of fuel which should be sold and consumed; food administrations established, and enforced even to the

extent of curtailing the amount of sugar to be put in one's breakfast coffee, and all this with hardly a murmur from our hundred million people.

Our troops broke the Hindenburg line, a bulwark of defense regarded as impregnable, and the greatest military power in Europe, fell to pieces like a house of cards, and its blatant Emperor sought refuge in ignominious flight, and we have seen a Republican President elected to succeed him.

We have seen the largest, strongest, and most autocratic government in Europe, crumble into dust at the demand of a starved and outraged people, and that mighty empire suceeded by a republic, and then by something neither wholly communistic, socialistic nor capitalistic, simply terroristic, not a real government, but merely a rule of force by those who seized the reins of power.

We have seen the Ottoman Empire surrender unconditionally to the victorious Allies, and then by reason of political differences among the Allies themselves, be allowd to remain in Europe, to defy those Powers to which it had surrendered, and after establishing a republic in name, to perpetrate upon Christian people crimes too horrible to mention.

The Suez Canal was dug and the British took over its control—a movement of far-reaching importance; Queen Victoria was proclaimed Empress of India, and that vast territory united under one political control, a condition which had not existed from the time of Asoka, nearly two thousand years ago, and that in a country containing three hundred million people differing in language and religion, and so vast that if its northern extremity could be laid on the map of Europe at Archangel, its southern point would reach Naples, its western Lisbon, and its eastern Constantinople.

The United States declared war against Spain, captured the Philippines, subjugated Cuba, and terminated completely Spanish rule in the New World, though it was Spain whose daring and saintly navigator discovered that world and claimed it for his sovereigns.

The Dark Continent was crossed and recrossed, explored and colonized, the Sahara Desert conquered by the automobile, and the Colonial Federation of South Africa established.

The Saint Gothard Tunnel was completed through miles of solid rock, and with engineering skill so perfect, that the variation when the drills met was less than an inch.

Specie payments were resumed by the United States after their necessary suspension during a great Civil War, which divided the North from the South and which abolished negro slavery from every State in the Union. National finance was placed upon a gold basis, and the fact recognized that fiat money is not money at all.

The Northern Pacific Railroad and other transcontinental lines have been constructed, whereby the East and the West have been inseparably joined.

The Bible has been translated anew, and a revised version issued.

The North Pole, sought for generations, has been reached and by this time probably perched upon by a flying machine, and the South Pole has been reached also.

Russia and Japan engaged in a mighty conflict. The East triumphed over the West, and the conflict ended by a treaty between these powers signed on American soil.

Niagara Falls and other great water powers have been harnessed for extended commercial purposes, the power transmitted long distances, so that great cities can be lighted, and their citizens transported in trolleys, factories run and all over wires which can almost be grasped by the fingers of a child.

Longer suspension bridges, than the world has ever seen before, have been constructed, and railroad tunnels have been bored under rivers and carried into the snows of the Alps.

The telephone has been invented so that we may speak mouth to mouth with thousands and tens of thousands of our people, and from distances measured only by the length and breadth of the land, and now the telepix, by which we can send a picture over a wire, and will soon be able to see the person with whom we are speaking, and by means of the telegraphone, a combination of the telephone and dictaphone, can record the message even if it be sent by wireless.

The phonograph has been constructed, so that the voice and musical sounds may be recorded, and we can hear and recognize the speech and the expressive tones of those who are absent, and even of those who are dead.

Subjects heretofore mysteries have yielded up their secrets. We have been taught the permanence of matter and the nature of combustion; the atomic theory, the law of equality of molecules, the interference of light waves, the nature of heat, electrolysis, the identity of electricity and magnetism, electrical laws, and the conservation of

energy, the chemistry of the stars, electricity and light vibrations in the ether, and Hertzian waves. Modern science has been born, geology, mining and metallurgy, chemistry, pharmacy, archælogy, electricity, biology, psychology, molecular physics, spectrum analysis and mathematical and photographic astronomy. Almost every branch of natural philosophy, a century ago was in its callow infancy.

Gasoline has been manufactured, and gasoline motors constructed with internal combustion engines using a spray carburetor, and applied to self-propelled cars over the land, to lighter-than-air dirigible balloons, and even to heavier-than-air flying machines, all so wonderful that the imaginary hero of our school boy recitations, is now a reality—poor old Darius Green with his flying machine.

Radium was discovered by Madame Curie, and its mysterious rays used in the treatment of cancer, and as a valuable adjunct in surgery. Roentgen discovered X-rays. We have Marconi's wireless telegraphy, the radio machine, by which we can "listen in" to the broadcasting of innumerable news agencies, and actually hear the news of the day as it is happening, can listen to church services by the absent method of treatment, and hear the coins fall upon the collection plate, without contributing.

The Panama Canal has been completed by the United States and its neutrality guaranteed.

The Boxer rebellion occurred, the Allies entered Pekin, a Republic has been established in China in place of an Imperial Government, whose existence was best measured in centuries. Open door diplomacy has either arrived or seems to be upon its way, and national self-determination is becoming an operative principle in political government.

Why in our day have so many pages of history been turned, and what is the reason for the vast progress we have witnessed? The answer is found in individual liberty, in freedom of thought, in the generous interchange of ideas, and in community of effort. Man for man, we have not advanced beyond the ancients. Our brains are probably no more highly specialized than theirs. Were Thales of Miletus living, he would be as great a mathematician as he was among his Grecian contemporaries, Plato could reason with the best of our modern minds, and Aristotle match his wits successfully with the keenest men of the day, but their individuality would quail before our community of effort, just as an alchemist taken from his cell, would be lost in a modern co-operative laboratory.

The want of harmony, which a century ago was too common among the physician, the surgeon, the dentist, and the pharmacist, has given way to mutual dependence, and the practitioner of each of these great sciences, has learned to work together for the relief of the sick and disabled. Besides the improvement in instruments, and in the mechanics employed, the general recognition of the necessity for absolute cleanliness is doubtless the basis of the chief advance —clean tools, clean clothes, clean patients, clean drugs, clean utensils and clean operating conditions in general. Could we conjure up a surgeon, a physician, a dentist and a pharmacist of the eighteenth century, and it would be difficult to find a real dentist in the modern sense, unless we called upon the artist, Charles Wilson Peale, who made Washington's false teeth, how astonished they would all be with the advance in diagnosis, with the clinical thermometer, and the stethoscope, with antiseptic surgery, rubber gloves, the advance in anæsthesia, in the local and general application of cocaine, with the importance of blood pressure, the theory of heredity, with major operations which have become minor ones, and operations daily witnessed that even recently were regarded as wholly unjustifiable, with bloodless surgery, the localization of functions in the brain, and with all the wonders of brain surgery, the use of chloroform and ether, and the control of malaria and yellow fever. How astonished they would be in learning that Havana had been freed of yellow fever in three months by the simple method of screening patients and destroying mosquitoes. How amazed they would be with the vast consequences resulting from the pioneer work of Lister and Pasteur, who as late as 1875 were alone in believing that fermentation and suppuration were due to microscopic organisms; with Koch's theory of bacteria; with the isolation of germs, and the statement that molecules could be fitted out to chase and destroy microbes like marine destroyers after torpedoes of the Tsetse fly and sleeping sickness; that the hook worm was being hooked itself, of disease carriers, of pasteurized and sterilized milk, of the systematic testing of cows with tuberculin; the control and possible eradication of tuberculosis; of immunity from typhoid fever and forestalling hydrophobia, by inoculation; of the use of insulin in diabetes; of antitoxin in diphtheria; of salicylic acid; antipyrin, aspirin, salol, resorcin, adrenalin, of the ductless glands and thyroid extract, and of salvarsan, metaphen and benzochrome.

These men would be astonished when they heard of vitamines, of the transfusion of blood, of the varied uses of radium, that a mod-

ern physician can watch his patient's breakfast after it has been eaten with greater advantage than he can before, and that the patient can examine a picture of his teeth while chewing his food and a picture of his bones showing where his vest buttons are placed with respect to his sternum.

Men have learned to work together instead of separately. This is the great lesson of modern progress, and whether we apply this lesson to our own work, or some communal effort like that done by this great College, we must go forward. Dead fish go down stream —live ones push ahead. This College, like some sturdy plant which has utilized its environment to the uttermost, and occupied every speck of available space, needs to be repotted, and given larger endowment, and increased facilities and opportunities. Two courses are furnished, one leading to a minimum degree in pharmacy, entitling the holder of its diploma to appear before the State Boards for registration as a pharmacist; and a post-graduate course and a Bachelor of Science course, which are for the development of more highly trained students, fitting them to fill responsible positions in scientific and teaching work connected with pharmacy.

In a hundred years the present College has been built up from nothing. It has given freely from its resources so that but little endowment was accumulated. No municipal or State aid was ever received. Its urgent need now, is the increase of this endowment to a total of $500,000, the minimum required to secure the College admission to the list of Approved Degree Conferring Institutions of the Central Atlantic States Association of Secondary Schools and Colleges. During the Centenary Drive some three years ago, nearly $400,000 was obtained in pledges, and of this total over 90 per cent. has been actually paid in, so that not much space remains to be covered before the goal is reached. To attain this result, its friends, its Alumni and its beneficiaries, who are the whole public, should work together.

The world moves on and we must move with it. We must not rest satisfied with what has been done, but rather dissatisfied, and strive for better results. The progress of the past should be our hope for the future. All progress whether individual or co-operative, is the result of thought. We must seek the truth. It does not spring out of the earth. It must be dug out, and when we seek it, we should remember that he that seeketh the truth seeketh God, for God is truth.

A MESSAGE FROM THE PRESIDENT OF THE PHILADELPHIA COLLEGE OF PHARMACY AND SCIENCE

To the Editor of the AMERICAN JOURNAL OF PHARMACY:
Dear Mr. Editor:

The AMERICAN JOURNAL OF PHARMACY is 100 years old. Few Journals live with increasing interest and vitality so long.

It seems to me appropriate at this time to review the history of the Journal and to take some thought as to its future.

One hundred years ago the Journal started almost coincident with the inception of the Philadelphia College of Pharmacy. It was a pioneer in this country as a medium of expression of all that pertained to the then growing profession of Pharmacy.

If one looks over the volumes of this magazine year by year for the past century, one finds recorded in its pages, every important advance in Pharmacy which gives it a special historical value. It is replete with records of Pharmaceutical Research, and with all that pertains to Pharmacy of the past. This Journal is rather remarkable for the even excellence of its work, always having been a credit to the College and the Profession from a literary, a scientific and ethical standpoint.

Today although it has many competitors, it still maintains its prestige as one of the foremost exponents of Pharmaceutical and scientific literature.

I always look forward to its issue, being sure to find something of interest, something enlightening and something of progress.

I feel that the Journal is to be congratulated on the long line of men of note in the Pharmaceutical and scientific world who have always kept up its high standard. The lives of many of its editors are among the foremost in the world of Pharmacy and the Allied Sciences. The Journal has for years been the one great professional light that has come to cheer, to refresh and encourage its readers in so many places remote from the great centers of scientific activity and has enabled them to keep in touch with the growing profession.

We feel today that never has the Journal been in better hands and that the editorial and managing staff deserve high commendation for their self-sacrificing efforts in maintaining its high standard.

The future of Pharmacy is so great that, as we look ahead, we cannot but feel that the years to come will offer a field for the Journal far greater and more important than any that has gone before. The future is in your hands and those of your assistants and we who know you have only the brightest anticipation of the continued well being of the Journal, complete and thorough professionally, a standard from a literary standpoint—and a model ethically.

Sincerely yours,

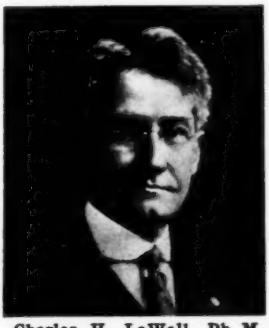
WILLIAM C. BRAISTED,
President of the Philadelphia College of Pharmacy and Science.

A MODERN SLOGAN WITH AN ANCIENT ORIGIN

A Bit of Pharmaceutical History With Some Sidelights Thereon

By Charles H. LaWall, Ph. M., Sc. D.

ACCORDING to the preliminary report of the Commonwealth Foundation recently issued by the Director, Dr. W. W. Charters, it is clearly evident that the aspiration of pharmacy to obtain professional recognition has received much encouragement. It has long been recognized by some writers upon the subject that pharmacy, like every other calling and profession, is a reflection of present practice rather than conformity to an ideal. To put it another way, pharmacy is a state of mind, and while the mental attitude of individuals is usually reflected in their actions, this is not invariably the case and many pharmacists are unfortunately judged by what they seem to be rather than what they are.



Charles H. LaWall, Ph. M., Sc. D.

There are pseudo-pharmacists and charlatans in the ranks just as there are quacks among the physicians and shysters among the lawyers. Unfortunately, however, for pharmacy, the externals are pretty much alike, and the public, which sees very little evidence of the real pharmacy that is practiced behind the prescription case, is usually incapable of differentiating between those who are really practicing pharmacy and those who only appear to do so.

The progress that has been made in pharmaceutical education within the past decade cannot fail to have had a beneficial effect upon the professional side of pharmacy, and the widespread and enthusiastic response of pharmacists throughout the length and breadth of the land in connection with Pharmacy Week, and the creditable exhibitions made by many pharmacists, are evidences of the virility of professional pharmacy.

One of the troubles of pharmacy is that its members do not know enough about the past history of the profession. The little they do know is warped and distorted, as half truths frequently are. The lack of this knowledge has developed a condition that almost amounts to an inferiority complex on the part of some pharmacists.

The pharmacist hears that at one time the grocers and the apothecaries were linked together, and he looks upon this as a sort of family skeleton to be discussed in whispers only by the cognoscenti. The facts are that the grocers of that time were simply those who sold drugs and spices in large quantities, or *en gros*. In Great Britain the retail trade in drugs, spices, and many other commodities was originally in the hands of the mercers (from *merx*, merchandise). The mercers later enlarged their functions and became importers, and their trade was divided among the pepperers, the spicers, and the haberdashers. The grocers were an outgrowth of the spicers who sold spices and drugs, and so when certain members of their group who compounded medicines, carried out chemical operations, and sold and dispensed medicines at retail, found that they were being dominated by those who simply bought and sold in large quantities, they justly resented such control and asked for release therefrom.

The group which carried on the professional work was called by the name of apothecaries. The separation of the grocers and apothecaries was gradual, so far as actual practice was concerned.

The grocers had been incorporated in 1345 by Edward III, but their first charter was not granted until 1429. Even prior to this earlier date the apothecary had been recognized as a member of a distinct calling, for in 1345 King Edward III granted a pension of sixpence a day for life to Coursus de Gangeland, a London apothecary, for having ministered to the King when he was ill. It is also a matter of record that Pierre de Montpellier was appointed apothecary to Edward III in 1360. During Queen Elizabeth's reign the separation of the grocers and apothecaries seems to have continued to take place, for in this period the College of Physicians summoned the Wardens of the Grocers' Company and all the apothecaries of London "and enjoined them that when they make a dispensation of medicine they should expose the several ingredients of which they were composed, to open view in the shops for six or eight days so that the physicians passing by might judge of the goodness of them and prevent their buying and selling any corrupt or decayed medicines."

In 1606 King James I granted the first Charter of Incorporation to the Apothecaries, but as this was not specific enough in separating them from the grocers, they continued their efforts for independence, with the result that in 1617 they were given an entirely independent

existence as a restricted guild, and the Guild of the Apothecaries is the only London guild which has never admitted to its membership any but actual practitioners, even to the present time.

The Grocers' Company, of course, resented the acquisition of independence by their former vassals, but their petition to the King received a solar plexus blow, the importance of which, viewed in the light of the changing meanings of words has never been fully appreciated because it has never been interpreted, so far as I can find, in pharmaceutical or medical literature. King James said *"Grocers are but merchants; the business of the apothecary is a mystery; wherefore I think it fitting that they should be a corporation of themselves."*


PHARMACOPŒA
SCHRODERO
HOFFMANNIANA
ILLUSTRATA ET AUCTA
OPUS
GENEVÆ,
Sumptibus SAMUELIS DE TOURNES.


FARMACOPEA
UNIVERSALE
CHE CONTIENE
DI
NICCOLO LEMERY
TRADOTTA DALLA LINGUA FRANCESE.
IN VENEZIA, MDCCXX.
Appresso Gio: Gabriel Hertz.

Title-page of two of the early Pharmacopœias, containing many examples of Polypharmacy.

The key to the interpretation of the above sentence lies in the Seventeenth Century meaning of the word mystery. The meaning of the word at that time, used in such a context as given above, was *"art, craft,* or *profession,"* as opposed to merchandising. The phrase "art and mystery of the apothecary," as seen in ancient indentures, therefore takes on a new meaning, and we recognize James I as having been the earliest author on record of a phrase equivalent to "Your druggist is more than a merchant."

It is probable that King James' attitude toward the apothecaries was influenced by his first physician, Sir Theodore de Mayerne, who was elevated to that honor in 1611, upon his arrival in England after having been expelled from the Paris College of Physicians, partly on account of his religious independence and partly because he was one who dared follow the teachings of Paracelsus and prescribe chemical substances internally. Sir Theodore is reputed to have introduced calomel and black wash into medical practice, and to have been largely responsible for the issuance of the first London Pharmacopœia in 1617.

During the balance of the Seventeenth Century the apothecaries were effecting their separation from the physicians, who had troubles of their own, for the surgeons, who were a sub-class of physicians, were trying ineffectually to throw off the domination of the barbers. The association of barbers and surgeons was even more ancient than that of the grocers and the apothecaries. One of Holbein's most celebrated paintings of Henry VIII portrays that monarch in the act of disdainfully handing the first charter to Thomas Vicary, the first master of the Barber-Surgeon's Guild, with fourteen barber-surgeons on their knees before their monarch, who does not even condescend to look at them.

This was the period in which the still familiar barber's pole originated, the red spiral indicating, in a sanguinary manner, the surgical association of that early period. The surgeons did not free themselves from their association with the barbers until 1745.

Garrison, in his comprehensive history of medicine graphically describes the Seventeenth Century physician as "a sterile pedant and coxcomb, red heeled, long robed, big wigged, square bonnetted, pompous and disdainful in manner, making a vain parade of his Latin, and instead of studying and caring for his patients, trying to overawe them by long tirades of technical drivel, which only concealed his ignorance of what he supposed to be their diseases."

It was during this period that the great plague of 1665 occurred in London, in which medical historians report that most of the physicians of London, including the great Sydenham himself, fled from the stricken city, but that the apothecaries remained at their posts and strengthened their place in public esteem.

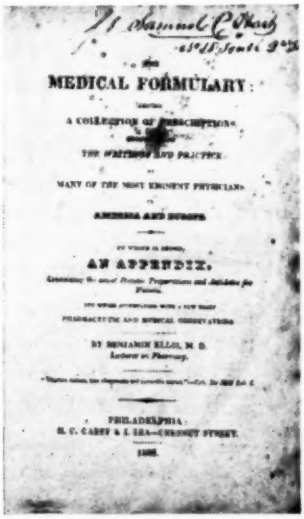
This is the period in which Moliere so caustically holds up to ridicule the pedantry and ineptitude of the French physician. The

army surgeons in Prussia during this period were ranked slightly above a drummer and beneath a chaplain, and were required to shave the officers, if they requested it.

Some of the handicaps which pharmacy suffers date back to its association with medicine in the Seventeenth and Eighteenth Centuries. The question of substitution has been one that has been an undeserved reproach upon pharmacy for years. Who were the original substitutors? The physicians, of course, for all of the literature on both medicine and pharmacy up to the Nineteenth Century was written by members of the medical faculty, and this includes all of the pharmacopœias as well.


TEATRO
FARMACEVTICO
DOGMATICO, E SPAGIRICO
DEL DOTTORE
GIVSEPPE DONZELLI
NAPOLETANO, BARONE DI DIGLIOLA.
CON L'AGGIVNTA DI MOLTI LVOGHI DEL DOTTOR
TOMASO DONZELLI
FIGLIO DELL'AVTORE.
DEL SIGNOR GIO GIACOMO ROGGIERI
ROMANO.
IN ROMA
M DC LXXVII

Title-page of an early Pharmacopœia which contains a authorized list of substitutes called "quid pro quo."


MEDICAL FORMULARY:
AN APPENDIX.
PHILADELPHIA:

Title-page of a Medical Formulary of a Century ago.

It may surprise even many physicians, and I know it will surprise most pharmacists, to learn that many of the medical works of the physicians contained lists of medicines that could be substituted for each other, and books were even written upon the subject by physicians, under the obviously explanatory titles of "Quid pro quo," "Succedanea," etc. I have never found a book written by a pharmacist that contained such a list, but there are a number of them attributed to physicians.

Who is responsible for the polypharmacy which persisted down to very recent times? Again the physicians of the Sixteenth and Seventeenth Centuries are to blame, for in the pharmacopœias of those centuries were collected and printed combinations that would even shame the polypharmacy of ancient Egypt. The nomenclature of the fearfully and wonderfully constructed preparations is as interesting as their composition: Aqua Imperialis with twenty-four ingredients; Aqua Magnanamitatis, with fourteen ingredients; Aqua Philosophorem, with thirteen ingredients; Aqua Contra Terrorem, with fourteen; Aqua Virtutium, with eight, all from one author of the Seventeenth Century, are examples, and the following are from another:

Aqua Mirabilis, with fifty-nine ingredients; Aqua Vitæ Pestilentialis, with thirty-one; Oleum Antipestilentiale, with forty-nine, some of these complex in themselves. The nauseating theriacs of the period of medicine reaching from Nicander to Lemery, were all originated or developed by physicians.

When we come to the question of secret nostrums, again we find the physicians of the Eighteenth and Nineteenth Centuries partly responsible. Bateman's Drops, James' Powder, Warburg's Tincture, Dover's Powder, Fowler's Solution, McMunn's Elixir, Hooper's Pills, and many others date from this period of which Garrison says: "Nearly every one of the great physicians of the time stood on a pedestal all his own, and many of these let it be known that they were in possession of private or secret remedies which were superior to all others."

The first exposure of patent medicines in the history of the medical and pharmaceutical professions was that of the Philadelphia College of Pharmacy in 1824, when the formulas of eight nostrums were published.

If pharmacy has a skeleton in its closet, medicine has a whole roomful of them, and they are seldom taken out for an airing. If pharmacy wished to reproach medicine with being, in part at least, the cause of some of her present difficulties, handed down from past centuries, she could hardly do better than quote the lines of one of the recent popular songs:

"You made me what I am today,
I hope you're satisfied."

THE FIRST CENTURY OF THE AMERICAN JOURNAL OF PHARMACY

By J. W. England, Ph. M.*

THE AMERICAN JOURNAL OF PHARMACY was established in 1825 "for the advancement of pharmacy and allied sciences and the promotion of correlated education and research, through the publication of the results of original investigations, selections from scientific periodicals and books, transactions of the College, editorials, reviews and similar matter, its main purpose being to promote the growth and development of the pharmaceutical sciences and to improve the condition and professional status of pharmaceutical practice."

J. W. England, Ph. M.

THE AMERICAN JOURNAL OF PHARMACY is the oldest pharmaceutical periodical published in the English language and it is recognized at home and abroad as the foremost scientific periodical of its kind in this country. It now faces a new century of duties and responsibilities of even greater moment than those of the past, because there has never been a time when the promotion of scientific research and scientific practice was so vitally important in American pharmacy as today.

The principal sponsor of the JOURNAL in 1825 was Daniel B. Smith, its first editor and its first contributor of an original article —"Epsom Salts and Magnesia." To him belongs the credit of having established, from its beginning, the periodical on a high scientific and ethical plane, and it is a remarkable evidence of his prescience that he immediately recognized the interdependence of pharmaceutical education and pharmaceutical research, because the one cannot exist without the other. Pharmaceutical education is applied research and pharmaceutical practice is applied education, and upon the bases of research, education and practice rest the science and art of pharmacy and its future progress.

It is not possible to here detail the many rich additions to the literature of pharmaceutical science and art that have been made within the 50,000 or more pages of the JOURNAL during the past cen-

* Chairman of the Board of Trustees of the Philadelphia College of Pharmacy and Science.

tury. It is sufficient to state that the JOURNAL has recorded the solutions of many research problems, by many workers, and that these have been, not only of rare scientific interest, but of great practical value to the pharmaceutical and medical sciences, and have found important industrial applications. The pages of the JOURNAL constitute the history of scientific research in American Pharmacy.

Among those who have contributed to the success of the JOURNAL there may be mentioned, especially, the following:

Daniel B. Smith, whose contributions cover a wide range of chemical and pharmaceutical subjects. He was probably the most learned pharmacist of his day and was remarkable for his versatility and his services in promoting American pharmaceutical research.

Thomas H. Powers, one-time partner of Smith & Hodgson, later of Powers and Weightman, who contributed articles on barium, mercury and morphine compounds.

John H. Farr, of Farr & Kunzi, later of Powers and Weightman, who contributed on quinine shortly after its discovery by Pelletier and Caventou in 1823.

S. G. Rosengarten, who contributed on brucine, and later, F. H. Rosengarten, who contributed on cinchonidine salicylate and bismuth salicylate.

Joseph Carson contributed numerous articles relating to early American pharmacology. He was particularly interested in medical botany.

Elias Durand was a contemporary of Daniel B. Smith and was deeply interested in scientific pharmacy and botany, contributing many original articles for the earlier volumes of the JOURNAL. He was the first to introduce (1835), the bottling of mineral water in this country. The apparatus, especially that part of it for bottling under pressure, was his own invention and superior to any other in use in France.

Augustine J. L. Duhamel, a protege of Durand, and for many years his chief clerk, contributed numerous articles of high scientific value to the JOURNAL. The process of displacement or percolation, for example, was first introduced into this country from France by Duhamel.

Robert E. Griffith was editor of the JOURNAL for five years (1831-1836), and during this period he made, by reason of his original papers on medicinal plants, a noteworthy reputation for the JOURNAL in this particular field of science.

William Procter, Jr., loved research and was an untiring worker. He made exceedingly comprehensive and thorough investigations in almost every branch of pharmacy and the character and extent of his services for his science and art made him truly, as he is called, "The Father of American Pharmacy." He contributed upwards of 500 original articles to the JOURNAL, exclusive of editorials.

Edward Parrish was a born educator and was particularly interested in the practice of pharmacy; he contributed some thirty-five articles to the JOURNAL.

John M. Maisch was one of the master-minds of American Pharmacy and may be called "The Father of American Pharmacognosy." He contributed upwards of 300 articles to the JOURNAL, not only on pharmacognostical subjects, but on almost every branch of pharmaceutical practice, and exclusive of editorials.

Albert B. Lyons has contributed a number of important papers to the JOURNAL. His work on alkaloidal assaying is authoritative.

Wilson H. Pile contributed valuable papers to the JOURNAL, especially those embracing his researches on weights, measures and graduated instruments, which led him to manufacture a number of physical specialties that acquired a high reputation for accuracy at home and abroad.

Edward R. Squibb may be called "The Father of American Manufacturing Pharmacy." His extended experience in manufacturing pharmacy and his open-mindedness in disclosing all his processes of work, was of the greatest importance in stimulating the upbuilding of this important branch of pharmaceutical practice. He contributed numerous papers to the JOURNAL.

Charles Bullock was the contemporary of Parrish, Procter and Maisch, and was frequently associated with them in the scientific work that has added so much luster to American Pharmacy. His investigations of the alkaloids of veratrum viride, published in the JOURNAL, were particularly noteworthy.

Emil Scheffer contributed a number of research articles to the JOURNAL. Probably the most important was his communication on his process for the manufacture of pepsin, upon which the modern method of pepsin manufacture is based.

C. Lewis Diehl made many important studies upon percolation and other pharmaceutical subjects. His articles in the JOURNAL are of the highest scientific value.

John Uri Lloyd for more than half a century has been one of the outstanding figures of American Pharmacy, and is widely known

at home and abroad for his splendid scientific achievements; he has contributed many important articles to the JOURNAL.

Albert E. Ebert was a devoted research worker in pharmacy and contributed numerous articles to the JOURNAL.

Henry Trimble, for five years editor of the JOURNAL, was a notable research worker in a number of fields, particularly in the study of tannins, for which he won an international reputation. His papers in the JOURNAL were not many—about twenty-five—his life was short—but they were of exceptionally high scientific character.

Frederick B. Power, one-time professor of analytical chemistry at the College, who won great fame for his original scientific investigations, has contributed more than a score of papers of the highest scientific excellence to the JOURNAL.

Henry S. Wellcome has contributed to the JOURNAL, and has exhibited his keen interest in research in the most practical manner, by establishing the world-famed Wellcome Research Laboratories of London, and of Khartoum, Africa, in both of which laboratories the work has been of the greatest scientific importance; for many years the direction of the work of his chemical research laboratories was by his talented fellow-classmate at the Philadelphia College of Pharmacy, Frederick B. Power.

Henry Kraemer loved science and research. He was a voluminous contributor to the scientific literature of his day and to the JOURNAL, especially along the line of botany and pharmacognosy. His studies of American Pharmacognosy were particularly noteworthy.

George M. Beringer, a master pharmacist, was editor of the JOURNAL for four years. His contributions to American Pharmacy have been many and important. Trained by Charles Bullock, as the latter had been trained by Daniel B. Smith, it was but natural that, early in his career, he should have been inspired by the life-work of these two leaders of American pharmaceutical research and become himself a leading research worker. His contributions to the JOURNAL during the past forty years, or more, have been of the highest scientific and practical value.

Martin I. Wilbert, from the year of his graduation from the Philadelphia College of Pharmacy in 1890, until his untimely demise in 1916, exhibited the deepest interest in his alma mater and in research work, and contributed over 100 articles to the JOURNAL, covering a wide range of subjects, such as experimental work on pharmaceutical preparations and literature relating thereto, metrology, reviews, educational and historical subjects and reports of the progress

of pharmacy. He was a member on the committee of publication for eighteen years, and his advice on scientific and ethical subjects was of the greatest helpfulness to the JOURNAL.

Probably no man has had greater influence in developing American Pharmacy than Joseph P. Remington. He was a master scientist and a master executive. Perhaps his greatest service was his promotion of research, not only by contributions to the JOURNAL, but no one of his time directed and dissected more research work than he, as chairman of the committee of revision of the U. S. Pharmacopœia for three successive decades. He loved science and he loved research and his services for the JOURNAL in making contributions and, as a member of its committee on publication for a score of years, in directing its policies, had much to do with promoting the growth and development of the JOURNAL.

There is another who, as chairman of the committee on publication of the JOURNAL for many years, did yeoman service in upbuilding it, both by contributions and by counsel, and this was Samuel P. Sadtler. He had a national and international reputation in pharmaceutical and industrial chemistry, and while intensely practical, loved science, and strove in every way to advance its interests. Not a little of the success of the JOURNAL has been due to his practical judgment.

During the past century the JOURNAL has depended for its material largely upon the contributions of individual research workers, but conditions are changing. Modern life has become so much more complex and exacting than formerly. Individual initiative is insufficient to prosecute continuous, systematic research. As Charles H. LaWall states: "The future development of pharmacy is largely dependent upon the stimulation of research, especially its inculcation in the student body. The work of the College in the past in this direction has been of the highest character, but it has been done unsystematically, and was largely a matter of chance that it was done at all. Men like Maisch, Procter, Remington, Sadtler, Kraemer, and others simply bubbled-over with initiative, and their efforts have enriched pharmacy and have made it better. Today, however, the output is limited, because every member of the faculty of our College is driven full-speed in taking care of his teaching and accessory work. To overcome such a handicap, the teachers should have more assistance for instructional work. The progress of any department of the College could then be measured not only by instructional results, but also by the quality and quantity of original work it turns out, and the College would have a standing among other scientific schools that instruction

alone could not give. Furthermore, students, graduates, members of the College, and others, would be inspired to follow the example of the faculty, and the field of research would be developed and co-ordinated."

We must have systematic and continuous research work at the College, because research is the life-blood of education and practice, and the present methods do not suffice. It looks as if the *real* solution of the problem lay in the establishment within the College of a separate department of research under competent and continuous direction, as has been suggested.

In conclusion it may be suggested, also, that it would be eminently desirable if the JOURNAL would publish an index for its issues since December, 1890. There has been three indices published so far, one from 1825 to 1870 inclusive, one from 1871 to 1880 inclusive, and one from 1881 to 1890 inclusive. It would be better still, if a single volume could be published embracing the matter of the whole century. Such a volume would be of the greatest possible usefulness to the research workers of American Pharmacy.

MERCK & CO.
MANUFACTURING CHEMISTS
New York

November 9, 1925

AMERICAN JOURNAL OF PHARMACY
Attention—Mr. Ivor Griffith, Editor
145 N. Tenth St.
Philadelphia, Pa.

Dear Editor:

During the thirty-five years in which we have been privileged to receive the AMERICAN JOURNAL OF PHARMACY, we have found it a fruitful source of information on the progress of pharmacy and allied sciences, and our own readers have profited much from the material we have so often reprinted from its columns.

Always reflecting the high ideals of the College under whose auspices it is published, the influence of the AMERICAN JOURNAL OF PHARMACY has been an inspiration to all of us, in whatever branch of the pharmaceutical field we are laboring.

As you prepare to celebrate your hundredth anniversary, we are delighted to join in the chorus of congratulations and good wishes that must reach you from all over the country and from beyond the seas.

Cordially yours,

MERCK'S REPORT.
G. W. MERCK.

A CENTURY OF PROGRESS PASSES—A CENTURY OF PROMISE DAWNS

By Fred B. Kilmer, Ph. M.

"AMERICAN Pharmacy is the best in the world." These are not the words of an arrogant American, but of a critical German (Kobart).

Fred B. Kilmer, Ph. M.

The spirit and action which has made American Pharmacy the best in the world is to be found in its college halls, in the wonderful associations it has organized, in the wholesome legislation it has fostered, and in the prolific literature it has given to the world. Above, and through all, has been the influence of those who teach, those who write, those who delve in the laboratories, those who give themselves to the service of pharmacy, and, finally, of that vast army of those who, day and night, serve behind the counter of the drug shop.

It is pleasing to know that the annals of American Pharmacy are written down as a permanent record in the pages of the AMERICAN JOURNAL OF PHARMACY, now entering its second century.

In a recent research, it was my task to scan every volume of this JOURNAL, and in them I found the history of the progress of pharmacy most faithfully, and often quaintly, recorded. The great masters have served on its staff and have written for its columns a running story of the problems, the activities and the achievements of the profession through a century—a flash of time in the world's history, but representing days and years and generations of earnest toil for those who have lived during the period. The JOURNAL must be recognized as the outstanding exponent of American Pharmacy.

My search into the literature of pharmacy led me into the leading libraries of this country and of Europe, and I found, on the shelves of the medical, pharmaceutical and scientific libraries all over the world, the AMERICAN JOURNAL OF PHARMACY, bound and indexed. Sometimes it was the only American journal devoted to pharmacy that was on file. Pharmaceutical journals all over the world have quoted and abstracted from it.

One's pride in American Pharmacy is strengthened, when he beholds the high esteem bestowed upon its literature in foreign lands. Pharmaceutical literature in the English language now dominates the world of pharmaceutical thought and practice. The British and the United States Pharmacopœias are world-wide in their scope. The American Dispensatories and text-books of pharmacy are found in every land.

A scanning of the pages of the JOURNAL may inspire a longing to have lived in those "good old days" of pharmacy. But that's a delusive desire, for the old-time druggists had a full measure of pain, sorrow and travail. They struggled against incompetent and unscrupulous competition, distrust, cut rates, burdensome taxation, and small returns. Through long and weary hours there lay upon their shoulders hard, heavy burdens. They experienced months and years of clouds and storms, with only occasional hours of sunshine.

The century covered by this JOURNAL has witnessed more changes in the condition of human life than has any previous thousand years in the world's history. Events have followed each other with bewildering rapidity. Science has poured out revelations which cannot be enumerated. The race itself has made rapid strides. Almost beyond compute are the advances in mechanical appliances, in the diffusion of knowledge, in the improvement of the conditions of life, political, social, moral and material.

The progress in medicine and surgery will never be wholly written—it has been too rapid and too far-reaching to formulate its measure. These changes, of necessity, have exerted a profound influence upon pharmacy. The onward march of hygiene, the prevention of disease, the conservation of health, the rise of manufacturing pharmacy, the rapid evolution of hospitals, the entry of thousands of synthetic products, the onrush of the newer materia medica, have brought great changes to the dispensing counter and to the practice of pharmacy.

The span of a few years has witnessed very marked changes in pharmaceutical journalism. The AMERICAN JOURNAL OF PHARMACY was not only the first on American soil, but it was the pioneer journal published in the English tongue. Drug journals are now numbered in scores in this country. Every phase of the many-sided calling is covered in word and in picture. Unstinted praise should be given to them, as they have molded pharmaceutical thought, and have uniformly and firmly upheld and supported every movement for the

upbuilding of pharmacy. Associated effort, education, legislation, wise business methods, scientific pharmacy, all things good have been ably championed in the journals.

In these later days, it is feared that the journals are not read as religiously as they should be. In far too many instances, their pages lie unopened and unread.

For many of the former generation, the drug journals were a substitute for college. For the present-day graduate, the pharmaceutical literature is a life-long post-graduate course. The world of pharmacy and allied arts, medicine and surgery, moves so swiftly that the pharmacist will fall behind unless he keeps informed through the journals.

The AMERICAN JOURNAL OF PHARMACY, while keeping abreast with changing customs, has rigidly and consistently held its course within the lines of professional pharmacy, undoubtedly helping American Pharmacy attain the high place which it now occupies.

The drug stores of the whole world now look to America for their inspiration.

Bradstreet's Commercial Register is witness to the fact that in its evolution the drug store has increased the commercial rating and the bank account of its proprietor. The modern drug store is a busy mart. The druggist has become a good merchant, while still retaining his professional attainments.

Wonderful and striking has been the sweeping change in the character and appearance of the drug store, and in its merchandising methods. Today, more than ever in the history of our art, must the pharmacist give attention to the making and keeping of money. Cost, expenses and profits, must have his close attention; the cash register must be kept ringing. Be he ever so accomplished a pharmacist, unless he is also a good merchant, he will make little progress. Happy is the man who can turn his powers and his skill as a pharmacist into coin. It is true that much good has been accomplished under the incentive of gain, but service, not the mere making and getting of money, must be the quickening spirit.

Pharmacy is a part of the great world of science that exists for men. The art of pharmacy must be applied to the doing of real things, the things of human need. The spirit of pharmacy is the spirit of service. If gain were the only objective, pharmacy, so far as it is an art or a science, would soon pass away. In pharmacy, more than in any other art, is felt the benefit of making a new thing,

or an old thing in a better way. Today, and in the coming time, the application of the new operations of that branch of science to which we belong is a saving word to the lives and works of men. It is to the spirit of service in pharmacy that we must look for its achievements and for its permanency among the world's vocations.

The past of pharmacy is fixed. For a century pages of this JOURNAL have recorded the labors of the "giants and saints" in pharmacy. "They now rest from their labors, and their works do follow them." Parrish, Proctor, Maisch, Remington, Hallberg and the great hosts have had their day. We cannot, and would not wish to, call them back. They would be out of place in this day and age, but the truths which they gave us still remain. Pharmacy has indeed a glorious heritage, but we cannot live in its past; into the future we go.

The Golden Age of Pharmacy is here. Never has there been such bright prospects for success as pertain today. Financial rewards, advancing education, progress in the sciences and arts, a rapidly changing world opens to us unlimited opportunities.

Pharmacy must mingle in the flux and flow that takes place in the world's alembic. The next century will see movements far greater than anything that has gone before. Whether pharmacy will keep pace with the moving, whirling world, with the trend of science, whether the drug store will have a place in the new-made world, is for its followers to decide here and now.

In the science of medicine, of which we are a part, we see a New Era, not yet formulated or defined, being shaped out of a new philosophy. We catch glimpses of it in newer physics, in radioactivity, in the breaking up of the atom, in the conjugations in physical chemistry, in biology and in many new pawns on the chess board of man's struggle with nature.

Modern progress is planted firmly upon machinery. The steam-engine, the steamship, the dynamo, radio and electric communication, the printing press and the conquest of the air, have bred a humanity with larger and higher aims.

There is at hand a new social and industrial order. The barriers between creeds, races, and nations, are being broken down. There is before us a scientific organization of industry, of politics, of morals. In brief, the whole scheme of our daily lives is being changed.

Today, and more so in the coming years, the successful pharmacist will need to acquire a title not at present conferred by the

colleges. He must become a Pharmaceutical Merchant. For him the progress of mankind, the reorganization of society, the shifts and changes of humanity, will mean great possibilities.

The patron of the pharmacy, the consumer, is a reader and a thinker today. The man on the street is gradually becoming versed in bacteriology, hygiene, sanitation, immunity, diagnosis and treatment. This education of the masses creates new wants, very many of which only the pharmacist can fill.

We are already walking in the vanguard of a newer materia medica —sero-therapy, organo-therapy, serums, toxins, anti-toxins, immunizing substances, bacterins, extracts from the whole animal kingdom. To this synthetic chemistry adds, without measure, alkaloids, derivatives, potent drugs. We have dreams of a drugless therapy, but anon the pendulum swings "back to drugs," and to drugs we must devote our talents for generations yet to come.

The end of disease and death is as far away as ever. The need for the drug man will remain as long as man remains man.

In the social movements of nation-wide and even world-wide extent there will be found a work-place for the carefully trained mind of the pharmacist. Coming rapidly forward is the great movement whose aim is to "keep well people well." Such a movement needs a focal point from which shall radiate health education, teaching the community the ways and the means of protecting itself against disease. It needs the offices of the pharmacist and the service of the drug store. Viewed in a business way, the modern trend of public health movements ought to create millions of new patrons for the drug store, ought to open new avenues of trade and create demands for a new order of products.

The pharmacist cannot afford to ignore this situation. He should not wait until he finds himself engulfed in laws and regulations, and his patrons directed to other channels. More than all other men, the pharmacist is fitted to be a teacher, a preacher, a leader, an adviser in and a dispenser of public health. On the business side, this must mean enhanced reputation, increased prestige, increased confidence, and, in the end, increased patronage.

And what lies in the future? How about the next hundred years to be recorded in the AMERICAN JOURNAL OF PHARMACY? Never in all history has pharmacy been so filled with hope as today. Pharmacy will advance and reach its full measure of joy and prosperity.

The firmament is illumined with promise. To be sure, there will be "flies in the ointment," and clouds in the skies. Man is still man. Nations, races, peoples, are ever-changing medicine and its allied arts are in a constant flow. Specialism, group medicine, hospitalism, glandular therapy, radio-therapy, physio-therapy, and drugless therapy, in their swing to and fro, vitally affect the apothecary shop. Every move in the social and political world reaches to the inner sanctum of the drug shop. Drastic warfare, the shifting of industries, the migration of the people from the farm land to the city, and the reverse, the changing food supply, the motor car and the airplane, emigration, the breeding of inferior stocks, all have their inevitable effects on the evolution of man, and hence upon pharmacy. The pharmacist of the future must meet and stem the ever-changing tide.

If we could read aright the soul, the spirit, the ideals of the throngs that pass our doors and fill our shops, we could visualize and feel the next hundred years. There lies, in the eyes of the multitude that flows along our highways, plans of an unseen and unbuilt country, vast panoramas of towns, waterways, chimneys, highways, cities and states of the future, pictures of new kinds and new sizes of men who will build not a new world, but an old world made over.

Pharmacy's destiny is bound up in the ideals of those who live within it. The time is at hand when no statesman or millionaire, no follower of pharmacy or any other calling who is not expressing the soul and freeing the bodies of men, who is not creating, gathering and filling the desires of other men, who is not hewing out the will of the people, can hope to exist.

The hope of the world of pharmacy is in its youth, in the boys and the girls who are looking with anxious wondering eyes toward pharmacy as a vocation, in the graduates pouring out of the college doors. Upon the college lies the burden of molding the coming generation of pharmacists to reach our expectations of it. With a mild envy, we look into the faces of these young men and young women entering into the coming years of pharmacy.

Standing in the dawn of the future of pharmacy, we see the skies laden with promise. We may wish that we might linger, that we might see the first staging of the greater things to come, that we might witness the realization of our now Utopian dreams. But this and more, much more than we can reveal, is reserved for our children and for their children yet unborn.

ONE VETERAN TO ANOTHER

As Editor of the *Pharmaceutical Journal and Pharmacist*, the official organ of the Pharmaceutical Society of Great Britain, and as an Honorary Member of the Philadelphia College of Pharmacy and Science, I have peculiar pleasure in tendering to the Governing Body of the College, and to the Editor of the *American Journal of Pharmacy* cordial felicitations on the auspicious occasion of the completion of its centenary. In point of age the *Pharmaceutical Journal* is sixteen years younger than its esteemed American contemporary with which formally, or informally, it has all along maintained fraternal relations. There is no particular virtue or excellence in age, as such. Many surviving ideas and institutions of great antiquity have wrought, and are working evil. But in all that makes for venerableness in which there is no taint of unrighteousness or decay, the *American Journal of Pharmacy* is justified by its record of a hundred years. In the wonderful century of all-around progress through which the world has passed since 1825, the *Journal* has played a notable part in the service and advancement of pharmacy and the allied sciences. Primarily the official organ of the historic Philadelphia College of Pharmacy and Science, it has in policy, plan and performance, sedulously and consistently operated in, and pervasively influenced the wider sphere of American and international pharmacy, moving always on a high scientific and professional level, and in steadfast opposition to every doctrine or practice derogatory to, or subversive of the purity, honor and dignity of the vocation, status, and prestige of the pharmacist, and the good name and fame of pharmacy. Alike for its manifold contributions to the science and art of pharmacy, and the sister sciences, and for its espousal and support of every cause for the betterment of pharmacy, the *American Journal of Pharmacy* has been an enlightened and beneficent power in pharmaceutical periodical literature. On this side, we pay homage of the mind and the heart to the *Journal* for all that it has achieved in the past century. We admire and prize it for all that it is, and our earnest wish is that under its present able Editor and his successors, it may flourish more and more in the second century of its career.

J. P. GILMOUR,
Editor.

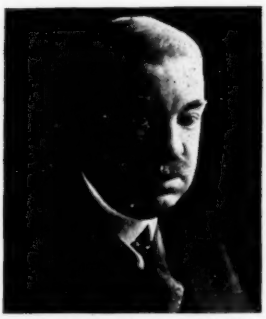
London, England.

MAKING MEDICINE HIT THE MARK

By Edwin E. Slosson, Ph. D.

Director, Science Service, Washington, D. C.

THE primitive medicine man prowled about the jungle by himself led by that insatiable curiosity characteristic of the scientist of all ages. Where the rest of his tribe saw only woods and weeds, his quick eye caught sight of a strange fruit or his sensitive nose detected the fragrance of an unfamiliar flower. He dug up roots and tested them. If they tasted good he said "That's a food." If they tasted bad, he said "That's a medicine."



Edwin E. Slosson, Ph. D.

The primitive medicine man was the astronomer, botanist, mineralogist and theologian of his tribe. He was chemist, pharmacist and physician all in one. He was also something of a phychologist. He interpreted dreams with the skill of a Freudian and he employed suggestive therapeutics in the most modern manner. He was in the widest sense of the words a general practitioner.

That the savage witch-doctor had in him the elements of a scientist is shown by his employment of deductive reasoning and inductive experimentation. Assuming that nature has provided a drug of every disease he drew the deduction that for every drug Nature must have provided a disease to correspond. So as he chewed a bitter leaf, bark or berry he ruminated: "From the taste it is evident that the essential principle is a glucoside or some toxic alkaloid with a name ending in *-in*." I do not know the language that this primitive medicine man spoke so I am translating his meditation in modern English. "Here," he thought, "is a medicine of some sort. What disease is it designed to cure? I can only find out by trying." So he set out to find a patient on whom to experiment.

When he found one who was sufficiently sick to be helpless he dosed him with a decoction of the queerest looking roots and the most aromatic barks and most acrid seeds that he could find. He administered salts scraped from the alkali beds and watched the effect. He made ointments and salves for the wounded. Sometimes he put the salve on the wound and sometimes he put it on the sword that caused

the wound. He observed, quite correctly, that one seemed to work as well as the other.

I am bringing this ancient history before you for two reasons. First, that you may give proper honor to the prehistoric practitioner of the pharmaceutical art and, second, that we may consider how we can improve upon his practice. This old hit-or-miss method of experimentation carried on for thousands of years was a painful process for the patients, however profitable it may have been for the doctor. But out of it came, in the course of time, the *materia medica* which was all the physician had to work with until, within the memory of the youngest of us, synthetic drugs began to be prepared. We are not yet freed from dependence upon the chance bounty of Nature and the chance discoveries of savage scientists. On one side of the drug store is sold quinine and on the other coca-cola, for both of which we have to thank the enterprise of the prehistoric Peruvians, who discovered these most useful of natural alkaloids, cinchona and caffein. But now such natural products are being supplemented and in some cases supplanted by artificial preparations of our own invention for specific purposes.

At any rate, we can improve upon the research methods of the witch-doctor of antiquity, for instead of trying out new drugs recklessly on bed-ridden patients as he did we can make use of white rats, rabbits and guinea pigs with little harm to them and with great benefit to humanity.

Now that we know that the chemist can equal or surpass natural products in some cases we should give him a chance to see if he cannot do so in all cases. The time has come for man to make a declaration of independence of the vegetable kingdom.

The pharmacologist of the past surveyed the world from China to Peru on the chance of finding somewhere some accidental ingredient of some plant which might happen to alleviate some disease. The future pharmacologist will rely upon his own resources and, having first found out the real cause of the disease, will then set out to devise and construct a compound that counteracts it specifically with as little incidental injury to the patient as possible.

The aim of the pharmacologist is to make the medicine fit the disease as it was the aim of the Lord High Executioner of "The Mikado" "to make the punishment fit the crime."

We need drugs that can distinguish between friends and foes. In allegorical paintings it should be Medicine rather than Justice who

has a bandage over her eyes, for Medicine has until recently fought blindly against the enemies of the human race. Now she is raising her blinder a bit so as to see what she is doing.

The earliest of living creatures to appear upon this planet, the bacteria, seem envious of all later life. The protozoa are waging a war of extermination on the metazoa. Human beings as the highest organisms suffer from the attacks of the lowest. In the struggle for existence between man and the microbe the weaker, minuter, inferior but more numerous party always wins in the end. In this, our fight for life, we face inevitable defeat and our fate is finally to become the food of our foes.

But though we are engaged in a losing battle we must keep up our courage and keep our microscopic enemies from overpowering us as long as possible. In this conflict the drug store is the arsenal and the drug-manufacturer is the munition-maker. This is the chemical warfare branch of the national defense service in peace-time. Chemists are the defenders of our lives against foes more dangerous than those of the late war. Even during that conflict the Allies suffered more fatalities from the germs than from the Germans.

Now success in chemical warfare, whether with munitions or medicinals, depends upon scientific research. We must invent new weapons of attacks and means of defense, antiseptics and prophylactics.

The curative effects attributed to the medical measures of our grandfathers would appear to be due to their having weakened the patient so much that the microbes were starved out and migrated to fresh fields and pastures new. But the day of the shot-gun dose has gone by. The modern doctor uses a rifle. In former times it often happened that the antiseptic aimed at a bacillus and killed a phagocyte. Before the era of recent research the best of antiseptics was carbolic acid. Yet carbolic acid applied to a wound killed off the invaders and defenders of the bodily citadel with almost equal impartiality. This is as if the United States, entering the war in defense of France, had showered poison gas all along the front and wiped out both the German and French armies.

But the new germicides like acriflavine, malachite green, gentian violet, acid fuchsin, brilliant green, crystal violet, methylene blue, and mercurochrome, not only destroy the microbe invaders of the human system, but help, instead of hindering its natural defenders, the phagocytes.

These, as anyone could tell by the names, are all dyes. A wounded man in the hospital nowadays looks like a camouflaged warship. We owe the opening of this new field to the discovery of Ehrlich that when you dye a microbe it dies.

This process of refinement, isolation and itensification to the pure chemical compound of highest possible potency may be carried out in the case of animal as well as vegetable products. Why do we have to use the horse as living laboratory for the manufacture of medicines? Because we do not know any better. We inject into the patient a miscellaneous mass of serums, toxins, anti-toxins, vaccines, anti-bodies, living or dead germs and their products, which at the best are harmless encumbrances, when all we want is just one particular kind of a molecule. If we could get that by itself all danger of accidental infections and probably even the sore arm might be avoided. So, too, the enzymes and glandular extract may ultimately be purified and transferred from the hazy realm of biology to the clear field of chemistry.

The misnamed vitamins are now being separated and concentrated and may eventually be produced as pure chemical compounds which may be administered in a pill to correct a deficiency of diet. Possibly they may be made synthetically and even now vitamins invented that will stimulate the growth of a particular organ or regulate some specific bodily process. But we shall not have to restort to vitamin pills if we plan our diet properly.

Here is the borderland where foods and drugs come together and I venture to predict that the distinction between them will be wiped out. I believe that ultimately doctors will become dieticians and drug manufacturers will devote themselves largely to the preparation of regulative foods. Bran biscuits may well serve as substitutes for Epsom salts and air-dried spinach for iron citrate. In other words, I look for the merging of medicine into hygiene. There will be less need for remedies when more attention is paid to preventives.

I rejoice to see the drug store being transformed into a restaurant and beauty parlor. The old-fashioned drug store, like the European apothecary's shop, was a place to be passed with a shudder like a dentist's office and never to be entered except in time of suffering and sorrow. The modern American drug store is a palace of delight, the favorite resort of young and old, male and female, the center of the social life of the village. The drugs that cure diseases are hidden away behind a prescription screen and most of the space is

given to the articles that prevent disease by keeping the body in good condition, the brushes and powder for the teeth, the ointments and washes that make the skin soft and beautiful. I know that the old-fashioned pharmacist hates to see his drug store develop into a department store. The other day I found myself downtown without a handkerchief. I had left my handkerchief in my other suit. I went into a drug store and going up to the showcase where were displayed shaving soap, safety razors, rubber sponges and bath matts, I inquired: "Do you sell handkerchiefs"? The old German chemist behind the counter answered emphatically: "Not yet, tank Gott!"

Nevertheless, I am glad to see the pain-killers displaced by joy-makers and the preferred position, ten feet from the entrance to the right, occupied by a marble and onyx fountain that dispenses the cup that carbonates but does not inebriate. In my youth it was customary to advertise a sure cure by a picture of an arm covered with ulcers or a face screwed up with agony. The modern advertiser is selling health and happiness. Perhaps he overdoes it at times. When I gaze on the beautiful poster in the street cars or color plates in the magazines I say to myself: "Oh, I wish I had that disease so I could take that medicine and look as happy and handsome as that patient!"

This removal of unpleasant mental associations with drugs enhances their therapeutic effect. It is not right that charlatans alone should take advantage of the beneficial effect of favorable suggestion. Food is more digestible if appetizing, as was proved by Professor Pavlov, of Petrograd.

Nature has taken pains to make her food products palatable and in most cases to mark her poisons by adding some bitter or disgusting denaturant. Animals seek a salt lick as children do a candy store. The vitamins and fruit acids are put up by nature in particularly attractive packages. So a man lost in a strange forest, with no guide to chemical composition except his untutored taste, would not be likely to suffer from either starvation or poisoning. He is not so safe in a modern resturant for there he may suffer from a deficiency disease while his appetite is satisfied and his bills are high.

Drug manufacturers should imitate and might well surpass nature in this respect, not merely by sugar-coating their pills but in co-operating with the dieticians in developing regulative rather than remedial agents, and so avoid such violent interference with the bodily processes as have in the past given to the word "drugs" its somewhat sinister significance. In other words, what I am advocating is a sort

of Limitation of Armament by which we may find it safe to scrap some of our heaviest ordnance and reduce the tonnage of our super-dreadnaughts. Disease is war; either an invasion of hostile hosts as in the case of tuberculosis or a local rising of insurgent cells as in the case of cancer. But war can never be ended by fighting nor can disease be abolished by curative medicine. Possibly the world may never be freed from war nor the body from disease, but we begin to see how we may work to that end.

A new era has opened with the advent of synthetic pharmaceuticals, and it gives promise of a healthier and happier humanity.

INDUSTRIAL AND ENGINEERING CHEMISTRY
PUBLISHED BY THE AMERICAN CHEMICAL SOCIETY
Mills Building
WASHINGTON, D. C.

November 10, 1925.

American Journal of Pharmacy,
145 North Tenth St.,
Philadelphia, Pa.

Gentlemen:

Pharmaceutical journalism has followed the trend of pharmacy quite generally and for that reason the majority of drug journals now published give more attention to the business side of pharmacy than to the professional side. Under these circumstances it is rather remarkable that a journal, which from its very beginnings has devoted its pages to recording the progress in the art and science of pharmacy, should reach its hundredth anniversary and still successfully maintain its professional aspect.

We congratulate our venerable contemporary and trust that it will continue to maintain its well-known policy of service to all that is pharmaceutical in pharmacy.

Very truly yours,

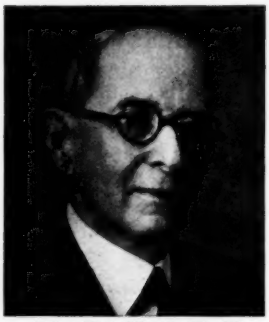
H. E. HOWE,
Editor.

The AMERICAN JOURNAL OF PHARMACY becomes a centenarian! With its December issue it rounds out a hundred years of service to American Pharmacy. This is an enviable record and one of which the Philadelphia College of Pharmacy and Science, which has published the Journal uninterruptedly since John Quincy Adams was President of the United States, may well be proud. The AMERICAN JOURNAL OF PHARMACY has been a strong and beneficient influence in shaping the destinies of Pharmacy in America. *The Druggists Circular* felicitates the Journal and wishes it Godspeed as it passes the century mark.

PHARMACISTS vs. SCIENTISTS*

John Uri Lloyd, Ph. M.

PHARMACISTS NOT PILFERERS. Indeed we are not pilferers. If we seek the treasures of the sciences—and we do—we have even under great disadvantages given to them in the past, and still are contributing to them in return. If we have gleaned from the fields of others, have they not in turn profited from our possessions? Honors are easy, and we certainly are not debtors. Step into almost any branch of science in which pharmacists seem to take liberties, trace the line backward, and conspicuous therein as an evolver of fragments of that science will be found the apothecary, though as already noted, the exacting duties of the practical side of his life often retard the development of the scientific counterpart.



John Uri Lloyd, Ph. M.

In many sections of chemistry and botany, pharmacists have led, and in some directions I am inclined to believe still lead. While we have not endeavored to pre-empt any department of these sciences, is it not a fact that we have by apathy perhaps here and there lost a rich inheritance? For, have not prominent and valuable leads been partly developed by the members of our guild, then turned over to others, and after the preliminary work was accomplished and the inheritance ready, then been lost one after another from our domain? How many facts evolved by the experiments of pharmacists, working simply for pharmacy, or in connecting fields, if of value in general science, have passed from the section of pharmacy to reappear in the domain of some one of the many collateral sciences? This is right; we are pleased to have it so, and pharmacists rejoice to have assisted the great work.

Largely through the labors of pharmacists the science of chemistry arose. Linked closely with chemistry is the science of botany and the study of microscopy, and all along the chain we find engraved conspicuously the names of prominent pharmacists. The toilers in

*Selected from a paper written and printed in 1894, submitted for criticism to Dr. Charles Rice, Professor Remington and others, then laid aside to remain unpublished to the present day.

all branches of applied science have ever included a large proportion of pharmacists, and this is the condition still. The drudgery of empiricism in the early day that was the immediate forerunner of the classified and connected sciences, was performed largely in the apothecary shop. And the impulse to discoveries that enrich the circle of sciences has often been furnished by the humble manipulator of the mortar and pestle, who perhaps in many instances has never received that just credit which would, if applied as merited, raise him from obscurity to fame. Many of the conspicuous scientific discoverers of the world have drawn their inspirations from the apothecary, whom all feel free to consult, who advises, suggests, assists, and then when humanity receives the return is too often neither mentioned nor recognized.

These facts are self evident, and recognized by all students, and it is pleasant to observe that most true scientists cover with charity the error and revere the memory of those who, amid unpleasant surroundings, toil and struggle as pioneers, and who, in the laborious fields of empiricism, collect the facts that serve as a ground work for the exact science that follows. There are, however, much to their discredit, persons indebted to empiricism for their scientific conspicuity, who sneer at those who adhere to experimental investigation, as there are children who hold in contempt the methods of their parents, whose toil, privations and sufferings, gave a heritage of luxury to their favored and too often snobbish offspring.

A Plea For Empiricism

No twinge of pain comes to my heart when men gifted by reason of advantages their fathers earned and handed over to them, step on the heads of my comrades and myself and press us down. Had it not been for the illiterate, ragged pioneer, the fertile plains of this land would not now be dotted with the universities and colleges that evolve energetic scientists. A pork packer may be even now laying the foundation for a university such as the world has as yet not dreamed of. The great Lick telescope could it mirror the past, would reflect a volume of misery, bloodshed, sorrow and anguish, as the illumined path across the burning alkali desert appears as a panorama before the gaze of the man of ease who now heirs the inheritance. The bones of those neglected wanderers are not more numerous than are the remains of the empiricists who lie forgotten and scattered over the desert of evolution, crowned now by the glass through which in

ease and safety science looks forward and not backward. It is a comfort to realize that honorable scientists revere the memories of those often misguided men. To me no sweeter reflection appears than that the true scientists with whom I come in contact recognize the good intention of those less fortunate than themselves and credit alike men who must work as we do, and men who begin beyond the point where we leave off. The man of science as I know him is a scholar, and one of the attributes of a scholar is that of being in every sense a gentleman and a humanitarian.

Turn where we may, we find as a foundation for every science, a precious heirloom, the work which the empiricist has handed down to his favored successor. After the patient, plodding empiricist supplies the observed data, the brilliant scientist is born. The newcomer arranges and collects the prepared material, and reads a law in the perfected whole. It is the relation of the quarryman to the architect. It is but a difference in location in work that distinguishes the empiricist from the scientist; for, had the modern formulator of the laws of science and the pioneer empiricist who antedated him changed places, the scientist would have been the empiricist and the empiricist would become the scientist. The disconnected results of empirical observations, made by men struggling in darkness, arranged into an orderly whole, by men who come, perhaps without an effort, into the inheritance, serve as the foundation on which all science rests.

Empiricists in the sense in which we have considered them are students of Nature. Those who scoff at experimental work and yet pretend to be lovers of science, should not overlook the fact that many, perhaps most of the rules and laws that are now known to govern nature's handiwork, would have no place in their own curriculum had it not been for the foundation laid by the patient experimenters who preceded. They builded wanderingly upward like the coral insect, and in so doing encased themselves in adamantine tombstones that bear no tribute to themselves, but serve as monuments on which others (the systematic scientists) engrave their own names.

I have thus entered this plea for empiricism, feeble as it is, for when a multitude is gazing in admiration at the gifts science is now showering on humanity, I feel that some person should record these truths.

Heartlessness of Science? Those who compile military history need not necessarily be soldiers, sometimes civilian on-lookers can take a more comprehensive view of a campaign than can the immediate actors therein.

Perhaps also one who stands no nearer to science than do I, can see some of the objects for which some of her votaries are searching, even more clearly than those actually involved in the turmoil. She is now reaching towards subjects once dominated by our membership and is seeking to elevate the scientific side of pharmacy instruction, and possibly in the accomplishment of that end, men who have never been educated as pharmacists will find it necessary to help crush our colleges of pharmacy.

It seems to me that science in seemingly usurping affairs that we once considered inherent to the possessions of pharmacists is but doing her duty, for the scientific side of our art belongs to science. When the University has at last displaced or dominated the colleges of pharmacy of our land, it will in return give a more scientific course of instruction than apothecaries who teach in these institutions, as a rule are in a position to evolve. We who work in business lines and also teach in colleges of pharmacy, bear the same relationship to trained men of science, that the home guard does to the regular soldier, and we must succumb at last to those who make science a specialty and who have no outside cares. This is not a pleasant reflection. Many who advocate a cause and then experience the systematic attacks of science, are prone to take the onslaught upon their cherished traditions or antiquated possessions as a personal matter, and to feel that science has a grudge against them, and aims to prosecute those outside her fold. This is an error, for science bears neither love nor hatred towards any being, and makes no distinctions between individuals; stepping in the trend of her evolution as indifferently on the shortcomings of her own members as on outsiders. Science is not heartless, but in seeking the truth, spares neither friend nor foe. She is not vindictive and the great cause, science, is not responsible for the littleness of men who cling to her skirts, and claim to speak in her behalf; who thrust their own narrow, peevish selves into her company, and vent their spleen in little actions or in spiteful language that a true man of science would recoil from—as a mother shrinks from an unclean word. Science is neither abusive nor heartless, and asks no man to distress a brother human,

to tell an untruth, nor to write a libel. And if science crushes the druggist teacher, it will be to better serve those who seek knowledge.

The Trend of Science In some portions of Mexico the people rent the right to bury their dead, but obtain the franchise of the grave for only a few years. In temporary receptacles the loving mother deposits the body of her child, or the child that of its parent. When the period of possession has passed (five or ten years, perhaps), the bones are scraped out and together thrown into a common receptacle, perhaps a hillside cave, where may be seen piled thousands of these relics. It may be truly said:

"Here the matron and the maid
In one common bed are laid."

Then, once more the old grave is rented and a newly sorrowing humanity weeps over the memory of those whose destiny is irrevocably that common end—the bone pile. I have seen near a Southern city, narrow oven-like compartments built on terraces high, one over the other, enclosing altogether a hollow square, and have been told that when a coffin is pushed from the front into one of these compartments, another drops out behind, carrying the relic of its former occupant to the accumulation of remains in the rear, where lizards creep, and insects and crawfish serve their useful purposes in the economy of nature, beneath a Southern sun.

So do we have the trend of science. All along the corridors of history we find the scientists of one generation pushing the remains of those who preceded them, out of the alcoves, over the edge, into a cosmopolitan grave. It is a common destiny and few participants take more than a minor part in this scientific parade. The errors of those who precede are dumped together and rest in the rubbish caves with the mistakes of those who follow. The spirit of truth only, as evolved by these men, moves onward. Errors once cherished as facts, are of no more consequence to scientists modern, than the cavern bearing its antique pile of skulls and thigh bones is to a native Mexican.

Never religious enthusiast was more dogmatic than has been the fanatic steeped in orthodox science; never pagan was more ruthless than is the scientist who raises his scimitar to cut down the standard of his misguided ancestors. And yet these men of science are faithful, sincere, earnest, courageous, self-sacrificing, and are working to

the betterment of mankind. Few of them ever reap any great personal reward in life. Few are conspicuous enough to even merit an individual mausoleum. They write their names on the surface of the reef, within which empiricism has entombed itself, and their own followers soon scratch them off again. So the scientist and the empiricist go down together into oblivion; and within a moderate period of time, only a few conspicuous names remain. The anticipations and disappointments of all others who preceded, rest in the silence of the past. Among them will be found the hopes and delusions both of empirical and of scientific pharmacists.

"On the graveposts of our fathers
Are no signs, no figures painted;
Who are in those graves we know not,
Only know they are our fathers."

November 10th, 1925.
THE STIRRING ROD,
San Francisco,
California.

American Journal of Pharmacy,
145 North Tenth Street,
Philadelphia, Pa.

Dear Sir:

California and San Francisco having just celebrated its Diamond Jubilee Anniversary, and THE STIRRING ROD in its October issue, having just published a section of many pages going back seventy-five years of drugdom's history in San Francisco, extends its best wishes to the *American Journal of Pharmacy* in the celebration of its one hundred years of service to the great purpose of Pharmacy and the Allied Sciences.

Without question drugdom today and Pharmacy as a whole has accomplished more in the last twenty-five years than in the first seventy-five, and this has been brought about through our great Colleges of Pharmacy and Sciences.

Philadelphia may well be proud of its College of Pharmacy, which stands as a foremost institution of its kind throughout the world.

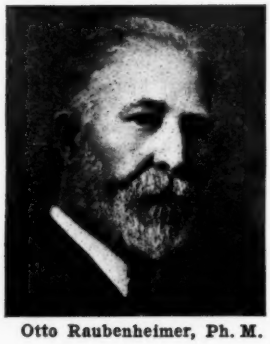
Very truly yours,

THE STIRRING ROD.
By S. J. WOLF,
Publisher.

IN EIGHTEEN TWENTY-FIVE

By Otto Raubenheimer, Ph. M.

IN CONNECTION with the Centenary of THE AMERICAN JOURNAL OF PHARMACY other important events of that year might be of interest.



Otto Raubenheimer, Ph. M.

General

George Stephenson, a young engineer of Killingworth, England, built and operated the first passenger train in the world on the old Stockton & Darlington R. R.

Schuylkill Canal completed.

Erie Canal completed. Started by Governor De Witt Clinton in 1817 and often ridiculed as "Clinton's Ditch" or "Clinton's Folly."

Work on Thames Tunnel resumed by Marc Isambard Brunel.

The consumption of Anthracite Coal in Philadelphia was 33 thousand tons against 365 tons in 1820. I might mention that in 1812 Colonel George Shoemaker of Pottsville was treated as an impostor and threatened with arrest for attempting to sell a few wagon loads of anthracite in Philadelphia.

Pennsylvania Fire Insurance Co., Philadelphia, established.

Events, Pharmaceutical, Chemical, Etc.

The Shakers at Lebanon, Columbia Co., N. Y., are the first to cultivate medicinal herbs.

Calumba was reintroduced into Mauritius by living specimens procured from Ibo in Portuguese East Africa by Captain Owen.

The French Island Réunion had an annual crop of 300 thousand tons of Cloves. Owing to the frequent hurricanes the yield now is almost none.

Cultivation of Cinnamon begins in Java.

Wholesale price of Ergot in London is 36s. to 50s. per pound.

Ginger Grass Oil in India first brought to notice by Dr. N. Maxwell.

Croton Oil imported from Madras to London by Short.

Siebold recognizes the poisonous properties of the fruit of *Illicium Religosum*, frequently confused with Star Anise.

Oil of Neroli analyzed by Bonaste.

Oleoresin of Aspidium first prepared by pharmacien J. Peschier of Geneva.

Buchner gives formula for the manufacture of matches.

Real rise of the beet sugar industry begins.

Boussingault and Rivero examine the juice of Ajuapar (*Hura crepitans*).

Dr. Church of Pittsburgh analyzes Bedford Magnesia Water.

Martius introduces the term "Pharmacognosy."

Atropine used in the examination of eyes by Franz Reisinger.

Homœopathy introduced in the United States.

Bouillaud describes and localizes aphasia.

Pierre Bretonneau of Tours, on July 1, 1825, performed the first successful tracheotomy in croup.

Weber Brother of Wittenberg bring forth their famous "Wellenlehre" or hydrodynamics of wave motion.

Wm. Beaumont begins his classic studies on digestion *in situ*.

Labarraque receives Prix Monthyon.

Thénard made a Baron by King Charles X.

Winckler, discoverer of Quinidine, buys Hofapotheke in Zwingenberg.

Marshall's drugstore to the "Golden Ball," Chestnut near Second Street, Philadelphia, established 1729, and managed by Elizabeth Marshall—first woman pharmacist in America—sold to Charles Ellis and Isaac P. Morris.

Law of December 1, 1825, regulates the final pharmacy examination in Prussia.

Foundation of Colleges, Associations and Journals

University of London.

University of Virgina.

Jefferson Medical College of Philadelphia.

School of Physics, Trinity College, Dublin, enlarged.

Fever Hospital at Bellevue, New York City.

Pharmaceutical Institute, University of Jena, by Göbel.

Polytechnic Institute in Karlsruhe, Germany.

Apotheker-Verein in Hunsrück, Germany.

Poggendorff's Annalen.

Journal P. C. P., changed to *Am. J. Pharmacy* in 1835.

Establishment of Pharmacies

Apothecary Shop of Andrew Geyer in Boston, prominent A. Ph. A. member.

September 29, 1825, Mohren-Apotheke in Munich bought by Bedall family. Dr. Carl Bedall, Sr., was one of the founders of the Deutsche Apotheker-Verein and the discoverer of Koussin, and his son, Dr. Carl Bedall, Jr., is author of the *Munich Formulary*.

Educational Events

James Simpson (originator of chloroform anæsthesia) and Charles Darwin (the Saint of Science) enter Edinburgh University.

Löwig (discoverer Salicylic Acid) studies chemistry at Heidelberg until 1828.

Wöhler at Polytechnic High School in Berlin (1825-1832).

Dulk (of Prussian Pharmacopœia Commentary fame), Privat-Dozent at Königsberg.

Otto Länné Erdmann, Privat-Dozent at Leipzig.

Runge (the real discoverer of aniline dyes), Professor at Breslau.

Bernhard, Studer, Professor of Geology at Berne.

Faraday, Director of Laboratory of Royal Institution (established 1800).

Liebig establishes chemical laboratory at Giessen, the first of its kind in Germany, which served as a model for future ones.

Wm. Stokes (1804-1878) obtains M. D. degree at Edinburgh.

Professor Physick, first American member of French Academy of Medicine.

Charles Jean Laubert (successor to Parmentier) resigns as pharmacien-inspecteur.

Pierre Boullay, President Societé de Pharmacie de Paris.

Noël Etienne Henry, General Secretary of the same Society and Editor of its Bulletin till 1827.

Inventions and Discoveries

Mackintosh discovers the solubility of India Rubber in Naphtha and successfully applies the solution in the fabrication of waterproof garments.

Jos. C. De la Cour, Camden, N. J., originated his celebrated Rubber Adhesive Plaster.

Drummond's Lime Light.

Glaser discovers the necessity of water in the distillation of Oil of Mustard.

Berberine isolated by Brandeis.

Faraday discovers Benzol and Butylene in compressed oil gas, made by the Portable Gas Company in London.

Faraday discovers that Ethylene and Butylene are isomeric.

Faraday examines isomeric and polymeric Hydrocarbons.

Chevreul takes out his first patent.

Quercitrin from *Quercus tinctoria* by Brandt.

Sinapin from *Sinapis alba* by Henry and Garot.

Guarine (Caffeine) from *Guarana* by Martius.

Parillina from *Sarsaparilla* by Pallotta.

Titanium isolated by Berzelius.

Gay Lussac improves manufacture of Oxalic Acid.

Diffusion of Gases observed by Döbereiner.

Azago discovers Rotatory Magnetism.

Leopoldo Nobili of Florence introduces the Astatic Galvanometer.

BORN IN 1825

Pharmacists

Thos. S. Wiegand, Philadelphia, revisor of Parrish's Treatise of Pharmacy. Died 1909.

Wm. J. M. Gordon, Cincinnati, first manufacturer of Glycerin in the West. Died 1909.

Albert L. Calder, Providence, R. I., of Tooth Powder fame. Died 1899.

Ernst Robert Schneider, apotheker, professor and examiner in Berlin. Died 1900.

Heinrich H. Hlasiwetz, apotheker and professor in Innsbruck. Died 1875.

Hieronymus Theod. Richter, German apotheker and mineral chemist.

Chemists

Sir Edward Frankland, professor at Manchester and London. Died 1899.

Emil Erlenmeyer, professor at Frankfurt. Died 1909.

Charles M. Wetherill, student of Liebig, and professor at University of Pennsylvania; prolific writer. Died 1871.

Felix-Hoppe-Seyler, professor of physiological chemistry and founder *Zeitschrift physiologische Chemie.* Died 1895.

Botanists

Daniel Hanbury, celebrated English pharmacognosist. Died 1875.

Ferd. von Müller, German botanist in Australia. Died 1896.

Corneille Ant. Oudemans, Dutch quinologist.

H. Wendeland, curator Botanial Garden in Herrenhausen, near Hannover.

It is a credit to pharmacy that these four botanical authorities had a pharmaceutical training and practiced pharmacy at the beginning of their career.

Scientists

Ludwig Rütimeyer, Swiss zoologist.

Karl Moebius, German zoologist.

John Call Dalton, American physiologist. Died 1889.

Thos. H. Huxley, celebrated English physiologist and biologist. Died 1895.

DIED IN 1825

Pharmacists

Charles Marshall, born 1744, first President P. C. P., son of Christopher Marshall, the "Fighting Quaker," who founded the apothecary shop to the "Golden Ball" in 1729 in Philadelphia.

Aug. Ferd. Ludwig Dörffurt, born 1767, apotheker and senator in Wittenberg.

John Edwin C. Ebermaier, born 1767, apotheker and physician in Düsseldorf.

Chemists

Adam Seybert of Philadelphia, born 1773, one of the very first Americans who had a chemical training in the School of Mines in Paris.

Benjamin Rittenhouse, born 1741, American inventor.

Physicians

Wm. Eustis, born 1753, American physician and statesman.

Joshua Porter, born 1730, American physician and soldier.

Naturalists

Conte Bernard G. E. de Lacepede, born 1756.

Jean Vincent Felix Lamouroux, born 1779.

André Pierre Ledru, born 1761.

BIBLIOGRAPHY

Pharmacopœias and Formularies

Pharmacopœia Borussica IV.

Pharmacopœia Bologna.

Pharmacopœia Lusitanica.

Pharmacopœia Pauperum III. The first edition of this "Pharmacopœia for the Poor" was published by the celebrated Dr. Hufeland in Berlin in 1810. This book still continues to live today, in a somewhat modified form as a Formulary, and is published annually as "Formulae Magistrales Borolinenses."

Dispensatorium Homœopathicum by Caspari, Leipzig.

Books

Fechner: German translation of Thénard Traité de la Chimie Elementaire, 5 Ed. (1825-1833).

Wöhler: German translation of Berzelius Lehrbuch der Chemie (1825-1831).

Stoltze: Deutsches Jahrbuch der Pharmazie (1821-1825).

Cutbush: System of Pyrotechny, styled by Prof. Edgar F. Smith as his *"real magnum opus."*

Ebermaier: Tabell. Uebersicht der Verfälschung der Arzneimittel. 4 Ed.

Reichard: Geschichte der Apotheken zu Ulm.

Hassenfratz: Traité de l'art de calciner la pierre calcaire.

Thos. Thomson: Attempts to establish first principles of Chemistry by Experiments. 2 Vol. London.

Kammarsch: Einleitung zur Technologie. 2 Vol. Wien.

Gehler: Physikalisches Wörterbuch. 14 Vol. Leipzig (1825-1845).

Martius: Amarantaceen. Bonn.

Nees von Esenbeck: Brown's Wissenschaftl. Botanische Schriften. 5 Vol. Nürnberg.

Fraser: Journey into Khorason (Persia).

Richard Haarlan: Fauna Americana.

Wm. Stokes: Introduction to the Use of the Stethoscope.

Louis: Recherches sur lar phthisie.

Sir James Annesley: Tropical Medicine.

Last, but not least Webster completes after twenty years his "Dictionary of the English Language."

Theses

"De nutritione phantarum nonnulla," by Heinrich Robt. Göppert, successor to Nees, for the Ph. D. degree, University Berlin.

Papers

J. Preschier, pharmacist in Geneva: Extractum Filicis Mas in *Bibliotheque Universale*, p. 205.

Conclusion

Let me hope that this paper, although incomplete, in spite of my researches during twenty-five years, will prove of interest, and above all, will arouse a little more attention to that much-neglected subject "History of Pharmacy."

The History of a Science is the Science itself!

THE FRANKLIN INSTITUTE
OF THE STATE OF PENNSYLVANIA
PHILADELPHIA

November 10, 1925

The Editor,
The American Journal of Pharmacy,
Philadelphia, Pennsylvania.

My dear Sir:

On behalf of the Journal of the Franklin Institute, I congratulate you heartily upon the completion of a century of service of The AMERICAN JOURNAL OF PHARMACY, and extend our utmost good wishes for a long continuance of your efforts, with the confident hope that they will meet with success and bring you much satisfaction.

Very cordially yours,

HOWARD McCLENAHAN,
Secretary, Franklin Institute.

Editor, *Journal of the Franklin Institute.*

To The AMERICAN JOURNAL OF PHARMACY, now celebrating its One Hundredth Anniversary, permit me to extend the conventional wish of Many Happy Returns of the Day.

For an American institution—and The AMERICAN JOURNAL OF PHARMACY is such—to be one hundred years old is a significant fact, and is still more significant when its present principles and policies are identical with those which prevailed at its foundation. No publication that I know of has been more constant to its early ideals: from the first number to the last the Journal has constantly upheld the best traditions of our craft, and in its loyalty to these traditions it has constantly rejected opportunities for self-exploitation and for greater financial returns.

To its pages the best men in American pharmacy have contributed their best work, and no history of American Pharmacy can be written without reference to the wealth of information to be found only in its volumes.

I am sure that I echo the sentiment of every American pharmacist in stating that the AMERICAN JOURNAL OF PHARMACY is a distinct credit to our vocation, and in expressing the hope that it may long continue to flourish.

Very truly yours,

J. H. BEAL.

ONE HUNDRED YEARS OF PHARMACEUTICAL RESEARCH

In seeking for words with which to express a tribute to the AMERICAN JOURNAL OF PHARMACY on its one hundredth anniversary we may, figuratively, apply the lines of Bancroft—"Each generation gathers together the imperishable children of the past, and increases them by new sons of light, alike radiant with immortality." Certain it is that the AMERICAN JOURNAL OF PHARMACY has been and is a shining light that shineth more and more unto a perfect development of pharmacy—it has been as a lamp to pharmacy and as a light to pharmacists.

The honored veteran publication has an unbroken record of one hundred years, it is the oldest pharmaceutical journal published in the English language, and it may be questioned whether it does not hold first place among all publications devoted exclusively to pharmacy and continuously under the same direction. It is worth while to determine the standing, as the question is occasionally asked, "What pharmaceutical periodical holds first place in point of seniority?" No American publication devoted to chemistry has to its credit as many years of service; the same is true of dentistry, and while the linking of medical publications to its predecessors may establish priority, there is, as far as the writer knows, no American medical journal that has not in its history what may be considered a break in its chain of years.

It is fitting for the Journal of the American Pharmaceutical Association to offer its congratulations and good wishes to the AMERICAN JOURNAL OF PHARMACY, not only because of appreciation of the coöperation and service, but because it issued the call for the preliminary meetings for the organization of the American Pharmaceutical Association and printed the reports thereof. The first editor, Daniel B. Smith, became the first president of the Association, and in its editorial lineage are men who gave life-long service to the organization. Among those who have passed onward are such distinguished pharmacists as William Procter, Jr., John M. Maisch, Henry Trimble and Henry Kraemer. For a number of years the minutes of the annual conventions of the American Pharmaceutical Association were published in the volumes of the centenary celebrant.

Much of that which was spoken and written during the centennial celebration of the Philadelphia College of Pharmacy and Science applies as well to the publication through which that institution has rendered most valuable services to American pharmacy. The history of the earlier years in the development of the United States, commercially, educationally, and professionally; the progress of pharmacy in its many activities; are all germane subjects at this time. There is nothing that contributes greater interest, strength and loyalty in a worthy activity than an acquaintance with its history. In that connection we might say much more, but others will write or have written, for, as has been stated, whatever is said of the College, which directs the usefulness of its Journal, will apply as well in many respects to the latter, and on that subject much research has been recorded and a number of addresses and reports have been made in commemoration of a century of pharmaceutical service—an era that has witnessed many changes of great significance for pharmacy—a period of time that has contributed so largely to its history that a most interesting volume of more than 700 pages touches only the high points of progress.

All honor to those whose labor and energies in behalf of the AMERICAN JOURNAL OF PHARMACY have always been directed for the elevation of pharmacy and extending its domain of usefulness, and coördinating its services with those in related professions so that original investigations may be productive of greatest good and best results.

E. G. EBERLE,
Editor, Journal of the American Pharmaceutical Association.

SINCE 1825

By Henry Leffmann, M. D.

EVERY moment is a centenary of some incident, but we cull from the records of the past, those incidents that affect us directly, and delight to greet the hundredth year of their history. It was in 1825 that the AMERICAN JOURNAL OF PHARMACY began the career which has proved so useful to the pharmaceutical profession and so creditable to all who have guided its course.

Henry Leffmann, M. D.

It is opportune then to view briefly the state of pharmaceutical and cognate knowledge in the birth-year of the publication. First as to the general environment. John Quincy Adams was President of the United States, the last to hold that office who were natives of the great Commonwealth of Massachusetts (for our present President was born in Vermont), which took such active part in the movement for independence. Monroe, of "Doctrine" fame had finished his term. The higher principles of American politics were about to pass away, for in four years Jackson succeeded Adams; the maxim that "to the victor belong the spoils" was openly promulgated, and has since been mostly applied.

A few years before the JOURNAL began, a convention, mostly of doctors, assembled in Washington, prepared the first issue of the United States Pharmacopœia. It was published soon afterwards, a small volume with text in English and Latin on facing pages. The first American college for systematic instruction in pharmacy had been started a short time previously and the Philadelphia College of Pharmacy and the United States Pharmacopœia were twin baby-figures of the "Giant mass of things to come" in American Pharmacy.

Chemistry and botany are linked in close relation with pharmacy, and it is worth while to inquire as to the condition of the former science, now grown to such enormous importance in world affairs. In 1825, several of the greatest of progresses had already been made. The atomic theory, as presented by Dalton, had been largely applied; Berzelius' system of symbols, after meeting with much indifference

and even antagonism, had prevailed, Davy had shown the composite nature of the common alkalies; Berzelius had made close determinations of the atomic weights and the phlogiston theory had lost its vogue. The "Era of Quantitative Analysis," Kopp's fourth and final period in his history of chemistry, had become well established. Perhaps the most epoch-making discovery in chemistry in 1825 was that of benzene by Faraday. The Faraday Society of Great Britain has recently made a celebration of the event. It was on June 16, 1825, in the laboratory of the Royal Institution, that he obtained the substance in the course of experiments made for the Portable Gas Company. In the notation of that day, oxygen being eight and carbon six, he assigned the formula HC_2 and called it bicarburet of hydrogen. Modern knowledge has changed all that, and as C_6H_6 with the now generally accepted ring-formula of Kekulé, it became the initiative of the immense mass of coal-tar synthetics. Faraday's fame rests, indeed, almost entirely on physical researches, the determination of the laws of electrolysis and the liquefaction of gases. The discovery of bromine and aniline followed in 1826, the latter substance however, not then derived from benzene, but by the destructive distillation of indigo, whence its name from "anil" the native name of the plant. In 1827, Wöhler announced the obtaining of aluminum, and while he is usually given credit for this initiative, claims have been lately made for Oersted as having obtained the metal some time previously.

1828, the year that marked the election of Andrew Jackson, saw the important step in organic synthesis by Wöhler in the conversion of ammonium cyanate into urea. By this, the essential distinction between inorganic and organic chemistry was broken down. It was seen that the products of vital action might be obtained by purely non-vital methods. It is true, however, that practical features require an independent treatment of the two departments, especially in these days of extensive multiplication of substances and high specialization of research workers. In 1829, a German chemist, Döbereiner, suggested a numerical relation of the atomic weights. He noted certain triads among the elements, such as calcium, barium, strontium; lithium, sodium, potassium; chlorine, bromine, iodine. Many years later (1864), Newlands, in England, pointed out substantially the "Law of Octaves" now so familiar as the periodic system, but chemists were so little prepared for such views that the Chemical

Society refused to accept his paper, and one member asked if Newlands had tried to find any relation between the properties of the elements and the initials of their names! Three years later, in 1832, Döbereiner observed the curious and as yet unexplained catalytic action of manganese dioxide on the decomposition of potassium chlorate, published in the first issue of Liebig's *"Annalen,"* the first instance of an inorganic catalyst, a type now so familiar and important in chemical industries. In 1836, Berzelius coined the word "catalyst." In 1832, also, Liebig proposed the "radicle" theory of organic structure. In 1883 came Faraday's epoch-making investigations into the laws of electrolysis. He established the quantitative functions of the electric current in its action on compounds, and introduced the terms "anode and cathode." It is interesting to note that in inventing these terms he placed the decomposing cell in the line of the sun's motion, having the positive pole to the East. He called the point at which the current entered, "ana hodos," "way up," and the point at which it left the cell, "kata hodos" "way down," contracted as now used for convenience.

An important event in pharmacy, has, however, been passed over. The Pharmacopœia of 1820 had served a most excellent purpose, but the progress of both medicine and pharmacy had rendered it insufficient. It was decided to revise it, and in 1830 this was undertaken and the decennial revision has endured to this day. Pharmacists took a much larger part in the first revision than at the 1820 convention, for their ability and influence had grown greatly since the introduction of systematic methods of instruction and the establishment of a code of conduct.

Stas' work on atomic weight determination began in 1840. Though necessarily largely routine with methods of great accuracy, it had an important bearing on a chemical theory that had been promulgated long before. In 1815, J. Prout, an English chemist, suggested that all atomic weights are simple multiples of that of hydrogen, and that each element is, therefore, merely an aggregation of hydrogen atoms. It was an attractive theory, for although Darwin had not, by many years, made evolution a dominant issue, chemists were inclined to look upon the elements as a sort of family, and no one could overlook the indications of genetic relation in such groups as the halogens, the alkali and alkali-earth metals. The natural explanation of the fractional figures in known atomic weights could

be ascribed to errors in determination, for analytic chemistry had not reached the accuracy of modern times. Stas conducted his work with great care and the data he obtained showed that fractional weights could not be ascribed to analytical errors—the Prout hypothesis was abandoned. For decades, no chemist gave any particular attention to the theory of common origin of the elements. Some enthusiasts still hoped that a primordial element would be discovered, or, at least, its former existence shown, and went so far as to propose the term "Protyl" for the same. Apart from many less known instances of fractional weights, the figure for chlorine was sufficient to silence the theorist. Yet at the present day the difficulty has practically disappeared. The discovery of isotopes, forms of a given element in intimate relation, having slightly different atomic weights, but whole numbers, which by association in certain proportion give a total of fractional value, are now recognized in many cases.

It would be tedious to continue to set forth year by year the events marking the progress of the science. A few salient points may be indicated in the order in which they developed. The decade beginning with 1840 saw great development in both theory and practice in organic chemistry. Liebig contributed largely to this work, especially in regard to nutrition. Gerhardt, Laurent and Hofmann were among the most active workers. The limited number of atoms concerned in the majority of organic compounds, the general interconvertibility of them, the fact that a large proportion of them are volatile without decomposition, thus permitting of accurate determinations of vapor density offered opportunities for researches on the transformations and for theoretical speculations as to atomic arrangement. The "type theory" was foreshadowed, but it was not clearly set forth until the next decade. The close of the "40's" saw two interesting results of research, the introduction of Fehling's solution and Wurtz discovery of the compound ammonias. In the following decade, Frankland's suggestion of valency (1853), was a great step in the application of theory to practice. Prior to this suggestion, organic compounds had been arranged in four general types, hydrogen (HH), water (HHO), ammonia (HHHH), methane (HHHHC). Frankland pointed out the relation between the saturating capacity of the elements, and also that with many elements a higher and lower capacity differing by two was observed. A French chemist, Couper, suggested indicating the valencies by bonds, and

thus came the now very familiar structural formulas. Naturally, these speculative views did not meet with universal acceptance, and it is said that Laurent once remarked that chemistry is the science of substances that do not exist.

At the beginning of the fifth decade came Pasteur's epoch-making work on the tartrates, which opened up the interesting and valuable data upon optical activity and racemism. In 1855 he developed his work on fermentation, thus founding the vitalistic theory of such actions. Along this line, bacteriology has opened up an immense field. In the sixth decade, came Graham's work on diffusion and dialysis, with the introduction of the term "colloid," now the slogan of a vast and fast extending field of pure and applied chemistry. This was the main impulse towards the development of physical chemistry, which now-a-days threatens to merge both chemistry and physics into one science and connect this so intimately with mathematics that the two original sciences will be lost to sight, though to memory dear to many.

Into American chemistry and pharmacy came, as a disturbing influence in the early sixties, the war between the States. Though far from involving chemistry and physics as did the World War, much activity developed in pharmacy on account of the large amounts of drugs needed for military use. In Philadelphia, the United States Government established a large pharmaceutical laboratory under the supervision of Professor Maisch of the Philadelphia College of Pharmacy. Of theoretic interest is the proposal of Kekulé's closed-chain formula for benzene, which has been of so much use in formulating the many cyclic derivatives and suggesting lines of research. Perkin's discovery of mauve was made in 1856, but the valuable industrial suggestions which this involved were allowed to pass unnoticed by British chemists, and it was left to Germany to originate and extend by the co-operation of theory and practice the coal-tar color industry.

Following the flight of time, came the suggestion in 1874, by Van't Hoff and Le Bel of the tetrahedral model for the carbon atom. Wislicenus extended the suggestions, introducing the stereo *cis* and *trans*-positions. In 1876 the American Chemical Society was founded. This last date brings us to a period partly, at least, within the memory of many chemists now living and suggests the close of the article.

THE EVOLUTION OF CHEMICAL TERMINOLOGY IX. PECTIZATION AND PEPTIZATION

By James Fitton Couch

"Terminology must be conventional, precise, constant; copious in words and minute in distinctions, according to the needs of the science. The student must understand the terms, according to the convention, not through the medium of explanation or comparison."—*Whewell.*

A CERTAIN laxness observed in the use of the two terms pectization and peptization indicates the desirability of considering their history and proper relationships in a system of scientific terminology. Both terms were coined by Graham during the early development of colloid chemistry to denote reciprocal processes; when a colloid solidified it assumed the pectous form and the phenomenon was pectization (Gr. pektos, to curdle); when the solid colloid was liquefied the phenomenon was analogous to peptic digestion and was termed peptization (Gr. peptikos, digestion). The terms have accompanied the various changes in colloid theory that have taken place in the past sixty years and have never been exactly defined. Graham explained what he meant by the terms through the use of analogies.

James Fitton Couch

Let us consider them one at a time. First, pectization. Graham compares pectization with the coagulation or curdling of blood, milk and egg-white.[1] He mentions fibrin, casein, and albumen as pectinizing substances and speaks of the coagulation of silicic acid gel by traces of alkaline carbonate. Graham does not, however, sharply distinguish between simple gelation and coagulation. He applies the term pectization to examples of either process referring to the pectization of silicic acid and of colloidal ferric hydroxide, terming the latter also gelatinization.

The term is defined in most of the principal dictionaries as synonymous with coagulation. This appears to be an erroneous conception, for while Graham did consider pectization a sort of coagulation, he included in the latter category all those processes that we today would refer to gelation and it is evident that he had no intention

[1] *Phil. Trans.*, 151, 183, 1862.

of limiting the term pectization to irreversible changes in colloids. He says, "Fluid colloids appear always to have a pectous modification," and again, "A tendency to spontaneous change, which is observed occasionally in crystalloids, appears to be general in the other (colloidal) class. The fluid colloid becomes pectous and insoluble by contact with certain other substances, without combining with these substances, and often under the influence of time alone. The pectizing substance appears merely to hasten an impending change. Even while fluid a colloid may alter sensibly, from colorless becoming opalescent and while pectous the degree of hydration may become reduced from internal change."

The fate of this term has already been decided by scientific men who have allowed the word to become obsolescent, substituting for it a series of terms, gelation, flocculation, and coagulation that are susceptible of precise definition. The term has passed out of common use because the concept that it originally designated has been dissected into several other well-defined concepts by the progress of colloid chemistry. If used today the term would undoubtedly be understood as synonymous with gelation.

It is is curious that, while the standard dictionaries present definitions for the term pectization, all of them ignore the term peptization, which is of nearly equal antiquity and which is growing in popularity. Graham coined it [2] when he became convinced that there is a difference between the liquefaction of a gel and solution in its restricted sense and he defined it by analogy with the process of digestion.

"Liquid silicic acid may be spoken of as the 'peptone' of gelatinous silicic acid; and the liquefaction of the latter by a trace of alkali, may be spoken of as the *peptization* of the jelly. The pure jellies of alumina, peroxide of iron, and titanic acid, prepared by dialysis, are assimilated more closely to albumin, being peptized by minute quantities of hydrochloric acid."

In modern usage, however, the term peptization has been used to describe processes of dispersion that fall outside the classical instance cited by Graham. Wo. Ostwald [3] defines the term, "Increases in degree of dispersion (of coarsely dispersed systems) are designated peptizations," and refers to it further in these terms: "The reverse of coagulation, namely peptization," and "The clay, an electro-nega-

[2] *J. Chem. Soc.*, 17, 318, 1864.
[3] *Theoretical and Applied Colloid Chemistry*, Trans. of M. H. Fischer, New York, 1917.

tive colloid, is peptized by the addition of small, but definite amounts of alkali." It should be noted that Ostwald regards coagulation "a decrease in degree of dispersion." A similar point of view is that of Zgismondy,[4] who limits the term peptization to the conversion of gels to sols under the influence of very small quantities of foreign substances. A medical viewpoint is expressed by A. B. Searle,[5] "The dispersion may be effected . . . by the addition of a suitable electrolyte (such as an acid or alkali) to a colloidal gel. From the analogy between this process and that of animal digestion it is frequently termed *peptization.*" The "Chemical Age Chemical Dictonary" defines peptization as "The transformation of a gel to a sol," thus making the term synonymous with "solation" which latter term is not defined by that excellent dictionary. In various other works the term is used to denote the conversion of any material into a colloidal sol with or without the interaction of some peptizing agent.

To bring order out of chaos it is evident that some conventional definition is needed to fix the meaning of the term peptization. Let us consider what can be done. It does not appear desirable to apply this term to the transformation of any material by whatever process into a sol. This concept is satisfactorily named by the term dispersion, which is happily used in a very definite sense by colloid chemists. Nor is there any necessity for the application of peptization to the conversion of a gel into a sol by simple mechanical means.

When we consider the classical simile of Graham, however, namely the peptic digestion of coagulated protein, a question of expediency arises. The application of the term to such processes certainly has historical justification and a certain scientific weight accrues to it by an empirical similarity between peptic digestion and what has been termed de-flocculation. Additional weight has been loaned to this application of the term through the varied usage of the term coagulation, which did not restrict the latter term to any very definite concept, and permitted an undue amount of loose thinking and positive misconception about colloidal processes. If, as was suggested some years ago,[6] the term coagulation be restricted to cases of irreversible change in which there is a complete or partial separation of the phases as a result of a chemical alteration of the system much misleading and ill-founded thought would be avoided.

[4] *Chemistry of Colloids,* New York, 1917.
[5] *The Use of Colloids in Health and Disease,* London, 1920.
[6] This Journal, 94, 91, 1922.

The present conception of the process of digestion removes it from consideration as analogous to simple colloidal change; digestion involves an extensive alteration in the chemical character of the coagulated protein, namely the hydrolysis of the protein molecule by hydrochloric acid under the catalytic influence of an enzyme, pepsin. This process has not yet been reversed; the original protein molecule has not been reconstructed from its decomposition products. The only resemblance of digestion to instances of true peptization, such as that of silicic acid by alkali, consists in the conversion of a coagulum into a fluid mixture. On this consideration it would be fundamentally erroneous to define peptization as the reverse of coagulation.

There remains to be examined but one type of colloid process to which the term peptization may be applied that is the transformation of a gel to a sol. This process may take place in two ways; a simple mechanical change in the system may reverse the colloid, as when a gelatine jelly is heated; or the addition of some electrolyte to the system may be necessary to convert the gel to sol, as the addition of hydrochloric acid to ferric hydroxide gel, or potassium iodide to silver iodide. The first type of change is satisfactorily designated by the term solation, which is growing in favor, particularly as a substitute for the ambiguous use of the word solution formerly so often employed in describing colloidal processes. The second type of gel-sol transformation in which an agent is introduced to effect the change really complies with the fundamental conception of the term peptization. To this type of change the term de-flocculation is sometimes applied, but this term is open to the objections that the gel may not be flocculated at the beginning and there does not seem to be a need for a distinct term to describe the peptization of a flocculum.

From a consideration of all of these facts it appears best to limit the term peptization to that type of gel-sol transformation in which the addition of an electrolyte is necessary to effect the change in the system.

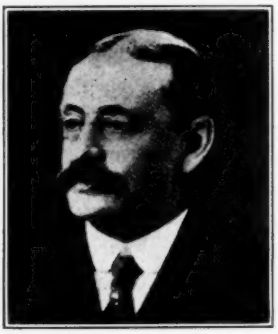
Summary

The histories of and various meanings applied to the terms pectization and peptization are considered. The term pectization is becoming obsolescent and should be allowed to disappear. Reasons are advanced for limiting the application of the term peptization to that type of gel-sol transformation in which the addition of a peptizing agent is required to bring about the change. The limitations of the terms solation, dispersion, and de-flocculation are also considered.

THE TREND OF PHARMACEUTICAL JOURNALISM

By George M. Beringer, A. M., Ph. M.

THE publication of the first number of the JOURNAL of the Philadelphia College of Pharmacy, one hundred years ago, marked a distinct advance and epoch in the history of American Pharmacy. It signified that the pharmacists of that period had come to realize that there was need for a current literature devoted especially to their field of service. In their judgment, the time was propitious for a journalism that would present the pharmaceutical viewpoint of materia medica and not that of medicine alone; for a magazine that would portray the progress of pharmaceutical sciences and the development of the art of the apothecary as a distinct branch of human endeavor.



George M. Beringer, A. M., Ph. M.

It is, indeed, fortunate that the progenitors of this movement were actuated by high motives and ideals and that this initial pharmaceutical publication in America was established on a high plane, both as to the professional and scientific standards. For some years it was, as stated by Dr. Robert E. Griffith, "the only publication of the kind in the United States, devoted exclusively to the furtherance of the pharmaceutic art." This pioneer Journal of Pharmacy undoubtedly has had an exemplary effect upon the character of many of the pharmaceutical periodicals that have entered this field during the century.

A cursory review of the volumes of the AMERICAN JOURNAL OF PHARMACY evidences that while it has followed the trend of pharmaceutical journalism and has catered to the current needs of the calling, it has leaned rather more toward the scientific than the commercial aspects of the drug business. The personalities and activities of its editors, as was to be expected, are reflected in its pages. The versatile literateur and scientist, and with all, one of the most practical pharmacists of his day, Daniel B. Smith was a happy choice for the first editor. His erudite contributions did much toward establishing the high tone and scientific foundation of the JOURNAL, which has been maintained to date. His successors, including such men prominent

in their day as Dr. R. E. Griffith, Dr. Joseph Carson, William Procter, Jr., John M. Maisch, Henry Trimble and Henry Kraemer, have all stamped indelibly on its pages their best endeavors, and their contributions will remain as classics in American Pharmacy. Each in his own way reflected his personal ideals and attainments, while trying to keep in touch with the pharmaceutic needs of his time.

William Procter, Jr., during his long period of service as editor from 1850 to 1871, contributed that voluminous series of practical papers that have never been equalled either in number or in demonstrating the problems peculiar to the apothecary.

The contributions of Dr. Joseph Carson, Professor John M. Maisch and Professor Henry Kraemer each presented in their respective times the viewpoint of a student of materia medica. Each had his peculiar angle of observation and each contributed important papers covering his researches and studies. Professor Henry Trimble's investigations of the chemistry of some of the vegetable materia medica, especially that series of papers describing the joint research work of Professor Edson S. Bastin and himself, were among the important contributions during his editorship.

As one critically views the current literature of Pharmacy, he is confronted with the changes that have already taken place in the practice of pharmacy and its literature and some other changes that are on the eve of occurring. We must expect changes and progress and so we are not altogether disappointed in noting the tendency of the pharmaceutical literature to drift into two distinct currents. The one might be designated as the ultra-scientific trend. In this we note various contributions, emanating largely from the workers in the pharmaceutical colleges and the laboratorians. In these we find many interesting discussions of chemic and biologic topics, structure, assay, etc., that are receiving the attention of this group of research workers and contributors. The other may be designated as the ultra-commercial trend. This is devoted to the problems of merchandising, purchasing, displaying, business methods, etc.

For some years it has been generally conceded that the druggists as a class were in need of more thorough business training and the colleges of pharmacy have been endeavoring to include this training, in theory at least, in their curriculums, as well as the purely scientific branches relating to pharmacy. The dual service, part professional and part commercial, rendered by the pharmacists in most sections

of the United States, justifies such as part of his education. A number of the current publications are devoting their entire space and effort to this aspect of pharmacy. Many of the articles published contain suggestions of material value, especially to those who are forced to compete with the present tendency to make the drug store a department store in which the sale of medicines is relegated to the rear of the place of business and the development of the professional service of the apothecary seems to be neglected.

While this may be the new order of things and representing the trend of the drug business at this period, nevertheless, it brings to the pharmacists of the old school a distinct regret that in the current American pharmaceutical literature, there is a dearth of practical papers of the type of the contributions that came from the pen of Professor William Procter and that aided so greatly in the development of real American Pharmacy. The problems of the apothecary are surely not all commercial. The practical problems of the laboratory and prescription departments are surely not all solved and these are of no less importance today than they formerly were.

The P. A. R. D. Bulletin wishes to congratulate the AMERICAN JOURNAL OF PHARMACY upon its one hundredth birthday anniversary, and to express its appreciation of the splendid work, that for a full century the JOURNAL has been conducting in the interest of professional Pharmacy and scientific progress in the allied sciences.

This, the oldest journal of its kind in the country, a product of the Oldest College of Pharmacy in the world, has at no time in its history kept itself so young and virile as it is at the present time. To use a hackneyed phrase, it might be considered "one hundred years young." Its intelligent presentation of the latest scientific facts together with its snappy, readable, comprehensive and interesting editorials, makes it unique in its special field of endeavor. It has never been published as a source of profit. Its aim has been altruistic, its circulation is world-wide. Its publication has been maintained often at enormous sacrifices. Its perpetuation stands as a monument to the lovers of truth in our honored profession and to that institution under whose auspices it has been published.

W. WILSON McNEARY,
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A VETERAN SCIENTIST TO A VETERAN JOURNAL

The completion of a century in the publication of a professional journal marks an epoch in its history which is well deserving of commemoration. During this period of time momentous changes have taken place in the affairs of men and of nations, and one must therefore be deeply impressed by the fact that, despite all difficulties and the disturbances of our national life, the AMERICAN JOURNAL OF PHARMACY has pursued its way peacefully and uninterruptedly for a hundred years. Having been established under the auspices of the Philadelphia College of Pharmacy, whose centenary was fittingly observed four years ago, the Journal has constantly maintained and promoted the interests of pharmacy and the allied sciences. As it now enters upon the second century of its existence the hope may be entertained that for many years to come it may not only continue to occupy the high position to which it has attained but still further extend the sphere of its usefulness.

There are probably but few now living whose acquaintance with the AMERICAN JOURNAL OF PHARMACY has been maintained for a longer period of years than that of the writer of these lines, which is now somewhat more than half a century. It was doubtless with that thought in mind that an invitation was kindly extended to me by the Editor of the Journal to participate in the commemoration of its centenary, and it gives me much pleasure by these few written words to respond.

It was in the year 1872 that I became associated with the late lamented Professor Edward Parrish as an assistant in his pharmacy and it was a great privilege to see and to read the AMERICAN JOURNAL OF PHARMACY. At that time it was the only scientific periodical accessible to me and its appearance each month was therefore eagerly anticipated. A further gratification was experienced two years later when as a student at the College an abstract of my inaugural dissertation was deemed worthy of record in its pages. The encouragement which was given by a recognition of these early efforts could only be fully appreciated in later years, for it provided an incentive to the further pursuit of scientific study and research.

The history of the AMERICAN JOURNAL OF PHARMACY reflects to a large extent that of the Philadelphia College, and the names of those who have been associated with it are closely interlinked with those of the institution under whose guidance it has so long been conducted. The inestimable service which has been rendered to American pharmacy during all these years by both the Journal and the College will long be gratefully remembered, and it may be deemed a privilege to extend to the Journal on the occasion of its centenary the most cordial congratulations with best wishes for its future.

FREDERICK B. POWER.

Washington, D. C.

"LET THE BLESSED LIGHT SHINE ON"

(Sunshine, Vitamins, Cancer)

By Ivor Griffith, Ph. M.

"CONSIDER the lilies of the field, how they grow—they toil not, neither do they spin." At least what spinning and toiling they do is done quietly and without ostentation. Yet were our ears attuned finely enough to hearken to the noise of molecules, and our eyes sensitive enough to catch the electric movements of the dancing atoms—we should soon know the throbbing activity among the millions of little cells that make up the modest lily.

Ivor Griffith, Ph. M.

Yes, indeed, they do spin, merrily too, and toil without end, picking their warp from the golden sunbeams and their woof from the warm bosom of earth. And on the loom of the lily is woven more than mere garments, more than form of flower and foliage, for her labors must also produce exquisitely delicate colors and perfume that lingers like an early love.

"Listen," said the Master "to the lesson of the lily." Then it was spoken in parable, a delightful figure of speech. But today it is more than a parable. For the comment of the man of Nazareth is now heeded, even by men of science. The lily and all of her kind are being considered and more closely studied than ever before.

The dependability of the animal kingdom, notably man, upon the energy binders of the vegetable kingdom is more than ever understood, and the future holds promise of much wider information.

Likewise great similarities between these kingdoms are more appreciated.

Life holds its court in the plant not much unlike it does in the animal being, and when it leaves the temple, Death comes with equal certainty. The final dissolution and the subsequent bacterial destruction of the animal frame is not different from the decay of the uprooted poplar or the cut lily. There is a circulation of vital fluid in the plant much like the blood that courses its busy way, everywhere in the human anatomy.

The fresh juices of plants behave much like this blood of the

animal. Even as human blood is divided into its four agglutinin and hemolysin groups, so is there a classification for plant blood. As rabbit blood sensitized to human blood will precipitate human blood and no other (excepting the blood of apes), so also will peony juice, sensitized to lily juice precipitate only the liliaceous group and no other. The tannin of the plant cell is not greatly different in some respects from the bile of the animal.

Yes, indeed, man and the lily have much in common. Only a great difference comes in that the lily despite its evolutional changes, remains a basic being, unaltered, unspoiled and incapable of changing its own destines.

But man, the time binder, has evolved brainward as well as in form, and his Frankensteinian brain has somewhat changed his destinies for the worse. No longer is he a basic being, but an unhealthy, spoiled, convention-bound, prodigy among animals. No longer does he live close to nature as he was intended to, but he has become host for innumerable parasites, his kingdom tumbles to earth with the onslaught of an unicellular microscopic vegetable, and now he cringes and quails at the imminent invasion of his earth by bugs and beetles. To his credit it might be said, that he assiduously exercises his brain to combat the very misery which his overwhelming mentality has created. Is it not reasonable for him, the spoiled, to turn to the unspoiled lily for his lesson? Humbly he now seeks there the answer to his frantic questions—and as certainly he will find them there.

Consider the Dread Cancer

Consider the dread cancer, destined unless remedy comes, to be the scourge of the universe. There is no denial of the statistics which affirm that this disease is on the increase. Throughout the world thousands of able men are dedicating their lives to the business of finding its cause. Its effects they very well know. Nor is the host of research workers, recruited from the ranks of the medical profession alone, for this type of work has never been the monopoly of any profession.

Indeed the most outstanding work of any in cancer research is that of Erwin F. Smith, the Washington plant pathologist. Ribbert, Kopsch, Jensen, Rous, Fibiger, Barnard and Gye and many others, have contributed greatly to the study of this problem, yet none of them has labored with more fruition than this scientist in Washington, whose cancer experiments have been largely conducted with plants. Animal experimentation with transplanted cancerous tissue, filterable

viruses and chicken sarcomas, worm cancers, angleworm, cockroach nematodes and tapeworm cancers, coal tar irritations and aniline dye cancers—all of these artificially produced cancers have greatly aided the study of the etiology of the disease—yet the diversified results gained all lead to a conclusion expressed by Dr. Smith, namely, that "Irritation, parasitic and possibly also non-parasitic—plus heredity can and does cause cancer." It was his careful study of the crown gall in plants that led the scientist to this conclusion. And while the crown gall is a parasitic manifestation (*Bacterium tumefaciens*) and as such not yet correctly comparable to human sarcoma or carcinoma, still it is taken generally as being in other respects quite analogous to the malignant neoplasms in animals.

Listen how like the human cancer is this disease of the lilies. It multiplies rapidly in the individual plant. Its growth is irrepressible. Its cell formation is described with these typical cancergrams—"deep staining, invasive or crushing, innumerable, disoriented cells and groups of cells. The plant tumors may be cut out or destroyed by caustic, yet they are liable to return. The growth is injurious to the whole plant if centrally located. *Certain plant families are immune* —yet others highly susceptible. *It is most destructive to young plants.*"

Is that not like the ravaging disease that comes like a phantom of the night to decimate our race?—and with the cursed touch of its chalky finger withers loud youth as readily as it does the weazened sire.

Truly if the plant pathologist finds such striking analogies in the animal and in the plant, one may hope that the answer to the riddle will some day be here found. Yet is it not very human to read from an article by Dr. Smith—"When I began to write on crown gall and talk to cancer specialists about it, they *laughed at me*"?

So too, in the Academie de Medicine, did the gluten-brained doctors of his city, laugh at Louis Pasteur, when he, a mere layman, essayed to convince them that a rosary chain of germs killed mothers in child-bed. But such ridicule only stimulates. Pasteur went on to far greater discoveries. So in their studies with the plants the physiologists are "still pursuing, still achieving."

A recently expressed opinion compares the pigment in the plant to the pigment in the human body—chlorophyll to hemoglobin. Here again we find analogies in many respects. Only that no comparison is made between the light-splitting functions of the two pigments.

Chlorophyll develops in the chloroplasts of cells exposed to light, and like hemoglobin is not produced in the absence of iron. One of its stated purposes in the plant is to select the particular rays of light necessary in the photosynthetic processes of the plant's metabolism.

Light and Life

Yet no one has ever ventured the statement that hemoglobin in the human blood may have a similar function there—*that the network of capillaries where this vital tissue unceasingly circulates, is so arranged as to give it the benefit of a great area of light exposure, so that it may abstract from the sunlight* **something** *which it converts, perhaps, to vitamins.* Has the blood, through the medium of its pigment, a specialized affinity for certain light rays and the faculty to modify, perhaps combine with, and carry these all through the body? Is it possible that irritated cells, or tissues where healing is constantly interrupted, lose their capacity for utilizing these essential light forces—that lacking the restraining forces—evil growth goes on the rampage?

Is it possible that cancerous tissue breaks down so because the blood no longer circulates there with its wonted freedom and its usual capabilities? The frank anemia of cancer is probably an effect—but preceding it may be a blood defect much more insidious and much more subtle. Pernicious anemia may truly be a cancerous state of the blood "tissue" itself.

As tannin and kindred compounds in the plant assist in the arrest of unfavorable light vibrations, is there in blood a similar compound? Lest there be doubt of the value of tannin in this respect, let a solution of this compound (gallic acid if in water) be painted over a part of the body exposed to the violet ray. Such an area will not show a burn, whereas the unpainted surface will. The presence of tannin in the cancerous galls of the oaks and elsewhere may be a protective measure of a sort. Of course, the insect infestation of the gall must not be forgotten. Nor are these the only manifestations of light reactions in plants.

For as truly as the earth moves around the sun, so truly is the human organism, just like the plant organism, indebted to sunlight for its life. The benefits of light are everywhere to be seen. Yet it is only recently that science has even looked in this direction.

But the by-products of this scientific search are rapidly increasing. The Finsen light, the X-ray, the ultra-violet ray, radium and its emanations, all use that end of the spectrum apparently so vital to biologic processes. Only during the past decade have the vitamines —sunshine under pressure—been discovered.

Dr. Salesby, of London, has recently written a most interesting book on "Sunlight and Health." In it he points out that cellar-grown plants cannot produce chlorophyll nor the cellar-grown child enough hemoglobin. The milk of cows fed on sunlit pasture is greatly superior to the milk of cows fed in the shadow. Useless cod liver oil may be activated by exposing it to sunlight.

"Making hay while the sun shines" is an axiom more scientific than sonorous. Range cattle are almost free from tuberculosis.

Cancer is largely a disease of civilization, and if that be so—truly it is because civilization has robbed our dietary of vitamines by over-grinding and over-chemicalization, by artificializing our heavily heated foods, and is still robbing our bodies of light through keeping them in the shadows of dyed garments of city smoke and of window glass that kills the sunshine.

One might even go so far as to state, that outside of excision, the only cure for cancer has been accomplished through the exercise of light rays that are beyond the violet of the spectrum, such as the X-ray, the ultra-violet and the several rays of radium. Is it possible that the ray cures of cancer are due to the fact that one end of the spectrum neutralizes the effects of the other end, as acidity neutralizes alkalinity, or vice versa?

Has this any significance? If this end of the spectrum plays such an important part in biologic processes, what may be the functions of the other end?—the infra red ray and its kind?

Has cancer anything to do with light rays—with vitamines—with the pigment of the blood, that is, in a degree different from other wasting diseases?

Truly these are but empiric speculations. Yet there are enough analogies between the vegetable kingdom and the human—between the laboratory observations of the plant pathologist in Washington and of the clinical picture of the disease in man—to warrant such odd surmises.

But the cause of this and other diseases will not be found by speculation. Doubtless it will be to the painstaking researches of the laboratory men that cancer will yield its secret. And that time is not far distant. Only today comes news that a Japanese experimenter has produced cancer in a mouse by modifying its diet and withholding certain vitamins.

Let the workers with the microscope and microtome continue their cellular quests—let the physico-chemical and electro-chemical researches go on—let the animal experimenters continue to torment the mild-mannered guinea pig and the long-tailed mouse—let the germ hunters still hunt—only let it not be forgotten that the microscopic habits of the laboratory often cause acute myopia.

Cancer is truly a macroscopic and not microscopic problem, and its cause may be found not in the laboratory, but in the kitchen—or out in the fields among the plants. Certain it is, that the plant physiologists will have played a significant part in this greatest hunt in history, and theirs, indeed, may be the honor of its discovery. God speed them.

AT THE HELM

1825—1925

THE JOURNAL of the Philadelphia College of Pharmacy was established in 1825 by the Philadelphia College of Pharmacy for the advancement of pharmacy and allied sciences and the promotion of education and research, through the publication of original articles, selections from scientific periodicals and books, transactions of the College, editorials, reviews and such other matter as might be deemed desirable. In brief, its main purpose was to promote the growth and development of pharmaceutical science and to improve the conditions and professional status of pharmaceutical practice. That it has fulfilled this mission is shown by the character and extent of its work during the past century.

The original Publishing Committee consisted of Samuel Jackson, Henry Troth, Solomon Temple, Ellis H. Yarnall, and Daniel B. Smith, who was chairman of the committee and practically acted as editor; and under the guidance of that talented authority, versatile scientist and public-spirited pharmacist, the publication was established on a high plane as an ethical and scientific pharmaceutical journal.

Four preliminary numbers were published at irregular intervals from 1825 to 1828; in 1829 the Publishing Committee was reorganized with Benjamin Ellis as the editor, and the publication of the JOURNAL at regular periods was begun and has been continued since.

When the College determined upon the publication of the JOURNAL at regular periods, it was also agreed to commence the consecutive numbering of the volumes with the new issue, hence the four numbers previously published have become known as the "Preliminary Volume." From then on until 1852 four numbers constituted a volume, except in 1847 when five numbers were published.

Upon the decease of Benjamin Ellis in April, 1831, Robert E. Griffith was appointed editor, and in 1835 the Publishing Committee was reorganized by the addition of Franklin Bache, Elias Durand, W. Hodgson, Jr., Joseph Scattergood, John C. Allen and Dillwyn Parrish and the name of the JOURNAL was changed to the AMERICAN JOURNAL OF PHARMACY.

Robert E. Griffith's service as editor added greatly to the influence of the JOURNAL, which had commenced to attract notice

Daniel B. Smith
1825-1828

Benjamin Ellis, M. D.
1829-1831

R. Egglesfield
Griffith, M. D.
1831-1836

Joseph Carson, M. D.
1836-1850

THE EDITORS
OF THE
AMERICAN JOURNAL
OF
PHARMACY
DURING
ITS
FIRST CENTURY
1825-1925

William Procter, Jr.
1850-1871

John M. Maisch
1871-1893

Henry Trimble
1893-1898

Henry Kraemer
1898-1917

Geo. M. Beringer
1917-1921

Ivor Griffith
1921-

abroad, and in 1836 upon his resignation, Joseph Carson was chosen editor, and he associated with himself Robert Bridges as associate editor from 1839 to 1845, and William Procter, Jr., from 1848 to 1850.

During the editorship of Joseph Carson, several circumstances transpired to improve the scientific character of the JOURNAL. The invitation to the Philadelphia College of Pharmacy from the official committee to participate in the revision of the United States Pharmacopœia in 1840, gave an impetus to pharmacy in Philadelphia which resulted in the establishment of the pharmaceutical meetings of the College and added considerable to the prestige and value of the JOURNAL.

In 1835 it was decided to issue the JOURNAL as a quarterly, and this was done until 1853, when it was issued bi-monthly; with the forty-third volume (1871) it became necessary, due to its increasing popularity, to issue the JOURNAL monthly, and this policy has obtained in the succeeding issues of the JOURNAL.

In 1848, when William Procter, Jr., was made associate editor of the JOURNAL, an editorial department was started which, during his incumbency as editor, became an important feature of the publication.

After a long period of active service, Dr. Carson retired in July, 1850, and William Procter, Jr., was chosen editor.

For twenty years the JOURNAL was reflection of this man's active outreaching mind. He filled its pages with valuable material adapted to the needs and contributing to the education of American pharmacists, while the publication increased the reputation of its editor and the College which sponsored it. His own service as an author is made apparent when it is known that there are 550 original articles in the JOURNAL to which his name is attached, exclusive of abstracts and editorials. The American Pharmaceutical Association was the offspring of Procter's able and versatile mind. Throughout the years of his life which followed the organization of that body, he gave to it the richest treasures of an intellect fitted beyond all others for the work which he had undertaken.

In 1852 an advertising department was introduced, and some changes made in the price, as well as the size of the JOURNAL. It was at this time that the American Pharmaceutical Association came into existence, and for many years the minutes of the proceedings of that organization and most of the papers presented at the annual meetings

of the Association were published in the JOURNAL almost verbatim, although no official connection existed.

The JOURNAL made notable progress until the Civil War when it became very much hampered in its work, but the editor and committee persevered through this crisis, and in 1865 a favorable reaction occurred which finally culminated in the election (in 1871) of a business manager, Henry H. Wolle being chosen to fill this position.

Upon the resignation of William Procter, Jr., as editor in April, 1871, due to failing health, John M. Maisch was chosen to succeed him, the Publishing Committee at this time consisting of William Procter, Jr., John M. Maisch, Charles Bullock, A. B. Taylor and Thomas S. Wiegand. Upon the organization of the committee a chairman, treasurer and secretary were elected. Professor Maisch impressed his strong personality upon the JOURNAL, and at no other period during its existence does the JOURNAL exhibit the wealth of original research which it contained during the Procter and Maisch regimes.

In March, 1872, James T. Shinn was elected in place of A. B. Taylor, and in 1874, upon the death of William Procter, Jr., Henry N. Rittenhouse was chosen to succeed him.

Upon the death of John M. Maisch in 1893, Henry Trimble was elected as editor, and the Publishing Committee was reorganized (1894) as follows: Henry N. Rittenhouse, Samuel P. Sadtler, Wallace Procter, Joseph W. England, and the editor.

Upon the resignation of Mr. Wolle as business manager in 1894, Miss Florence Yaple was chosen his successor, and she remained with the JOURNAL in that capacity, and later as assistant editor, until her death in 1912.

In 1898 when Henry Trimble died, and Henry Kraemer was chosen to succeed him as editor, the Publishing Committee was increased to seven members; Dr. Richard V. Mattison, and Joseph P. Remington being the additional members.

By this time, the field of which the AMERICAN JOURNAL OF PHARMACY had been the sole occupant in the United States for almost three-quarters of a century, had been considerably extended and to a great extent was now cultivated by several other JOURNALS. The pharmaceutical literature of North America, which at the time of the inception of the AMERICAN JOURNAL OF PHARMACY was in its infancy, and which in fact dates its birth with the beginning of the

JOURNAL OF PHARMACY was by this time well-known and duly appreciated throughout the civilized world.

Henry Kraemer entered upon his field of service as editor and fully maintained the high scientific character of the JOURNAL. His world-wide contacts in the sciences of biology and botany gained for the JOURNAL added prestige in European literature and the exchanges established during Professor Kraemer's time continue to the present day. It is not surprising to find then that there is hardly a corner of the world where the JOURNAL does not go. Every month it regularly sails the high seas to hospitals, pharmacies, laboratories and libraries in India, Australia, South Africa, Japan, China, New Zealand, Java, Egypt, Arabia, and to practically every European capital. Its influence is international. It bears to countries far and wide the classic message of American pharmaceutical science. From the modest Quaker pamphlet of 1825 it has grown to its present size and eminent position in the field of scientific literature.

In 1904 the title of the Publishing Committee was changed to that of Publication Committee, and in 1922 to Committee on Publication.

In 1917 Henry Kraemer resigned the editorship because of his acceptance of a chair in the faculty of the University of Michigan, and George M. Beringer was chosen as editor, at the same time holding the position of Chairman of the Board of Trustees of the College. Under his able management the JOURNAL was materially increased in size and continued to be the journalistic advocate and consistent exponent of the ethical practice of pharmacy.

The business management of the JOURNAL during the editorship of Mr. Beringer, and to the present time, has been efficiently cared for by H. J. LaWall and C. E. Wetzel, who have placed the business activities upon a sound basis.

Upon Mr. Beringer's resignation as editor in March, 1921, Ivor Griffith was elected editor. He has endeavored to keep the JOURNAL true to its name—that is, an American journal of pharmacy, ever encouraging research by American pharmacists and providing a wealth of scientific information accurately and interestingly recorded. His aim is to perpetuate the long established policies of the JOURNAL and to keep sacred the splendid traditions which have obtained under the management of the eminent men who have preceded him.

The members of the Committee on Publication which functions at the time of writing this article are Charles H. LaWall, E. Fullerton

Cook, J. W. Sturmer, Jos. W. England, John K. Thum and Arno Viehoever. Dr. Henry Leffman has served for several years as a special contributor and readers of the JOURNAL know full well the inestimable value of Dr. Leffman's service in that capacity.

The publication of the JOURNAL of the popular science lectures delivered annually by members of the Faculty of the College has been a most successful undertaking. These volumes have found their way into school and college libraries the country over, and have provided a most adaptable instrument for popularizing scientific education.

It is manifest that great changes have come into the practice of Pharmacy in the century which covers the existence of the JOURNAL. Nor have these changes always been for good. But the policies—the aims and ideals of this exponent of the science of pharmacy—have not changed. Nor need they change, for there can and will be no change in the basic principles of a profession whose honored privilege it is to produce the material for the healing of the sores of mankind.

So long as the hand of pain rests heavily on the hearts of little children—so long as the nightmare of agony surrounds the birth-bed, so long as strong men shudder in the cruel grasp of hideous maladies —just so long will pharmacy persist, and just so long will the AMERICAN JOURNAL OF PHARMACY we hope, preach the gospel of honest, earnest service in every phase of Pharmacy.

IVOR GRIFFITH.

MEDICAL AND PHARMACEUTICAL NOTES

THE PHARMACIST AS WE KNOW HIM TODAY.—Recently there have appeared several articles in certain of our contemporaries criticizing the pharmacist for counter-prescribing—and other supposed errors of omission and commission. The injustice of these attacks cannot be too strongly condemned, for they have no basis in fact. Thanks to the noteworthy progress that has been made in pharmacology, chemistry and associated branches of science, and the development that has taken place in our colleges of pharmacy, the pharmacist today is a member of a scientific profession. He is so busy keeping in touch with pharmacal advances and the countless details of his business that he has no time nor inclination to counter-prescribe. One has

only to become familiar with the average busy pharmacist to appreciate the truth of this. Today the druggist does not find his sales made up of such items as "ten cents' worth of camphor," "two ounces of paregoric," "an ounce of gum arabic for making mucilage," "a package of sage leaves," or "an ounce of chamomile leaves in eight ounces of spirits of juniper," as once was the case. On the contrary, his calls are much more complex, time-consuming and important. He cannot give the time nowadays to listen to a patron's story of his cough, and to fix him up a quarter's worth of honey and tar, or a mixture of rock candy, glycerine and spirits of frumenti. While the pharmacist was giving his thought and attention to the foregoing today, he would be very apt to lose a dozen other much more profitable and important sales. This is the purely business side of the question.

But there is another, which is of far greater influence, in establishing the pharmacist in his true relation to medical practice. This is presented by his education and training, which teach him that he is a professional man, with functions and obligations as distinct, and in their way as important, as those of the physician. In other words, the educational and scientific requirements of the present-day pharmacist have defined and emphasized his activities and professional duties to an extent that leaves him no inclination or desire to trespass on the work of the medical practitioner. The onward march of pharmacy has given him plenty to do in his own field of activity, and in his efforts to meet the multiplicity of demands constantly arising that are definitely within his sphere, he has no time to engage in counter-prescribing. Indeed, the educated pharmacist, as we know him today, very properly looks on any such violation of his profession as stultifying, and beneath him. His professional associations and his organizations have brought the ethics of pharmacy to the front, and accomplished a splendid work in demonstrating that the practice of pharmacy is indeed a learned and dignified profession, and not merely the pursuit of a business calling. And in exalting the professional and scientific character of pharmacy, the druggist's organizations have not only taught him the deepest respect for his work but shown him that he owed it to himself, and to his standing as a pharmacist, not to encroach on medical practice, or to violate the ethics of the pharmaceutical profession.

Too great praise cannot be given to the admirable code of ethics which has been adopted by the American Pharmaceutical Association. No one can read these principles of ethics without recognizing the

important place pharmacy occupies today in the promotion of human welfare. The promulgation of this code of ethics, and the widespread dissemination among the people of the slogan, "Your druggist is more than a merchant," have accomplished a great deal, not only in establishing the true status of the pharmacist in this country, but in placing pharmacy on a plane of scientific service and efficiency that deserves the hearty approbation of every thinking person.

Especially is this elevation of pharmacy to a higher and better plane a matter of importance to every member of the medical profession, for it means better and truer progress in the scientific selection and preparation of modern remedies in the treatment of disease. A pharmacist who is true to his calling, and alive to its scientific opportunities, is worthy of every consideration. He deserves the hearty commendation, support and co-operation of every practitioner of medicine and of the community for he is playing a leading part, both in our present-day conflict with disease and in the advancement of human health and well-being.—*American Medicine.*

Identification by Chemical Methods of Drugs Containing Tannin. A. H. Ware. (*Pharm. J.*, 1925, 115, 131-135.)—Addition to a solution of quercitrin in 19 per cent. alcohol of pure zinc or magnesium and sufficient concentrated hydrochloric acid to yield a steady stream of hydrogen results in the development of a pink colour, this being more rapid if the liquid is heated. The colour increases in intensity to a deep cerise or red and then gradually fades; if alkali is added to this colourless solution a purple coloration forms, but if it is added to the deep red solution this becomes green. With the acid and zinc, aromadendrin behaves similarly to quercitrin, except that the red coloration formed is more intense, and is changed to yellow by addition of alkali to make the liquid approximately neutral; addition of the alkali at the end of the reaction gives no distinctive result.

The following two modifications of the ferric citrate precipitation test (Analyst, 1924, 49, 442, 467; 1925, 335) are given:—(1) Five cc. of a fresh aqueous extractive or of a water-diluted commercial extractive are boiled with 10 to 12 drops of 33 per cent. acetic acid solution and 5 cc. (more if necessary) of 0.25 per cent. aqueous iron ammonium citrate solution, and the liquid cooled, filtered, treated with 1 grm. of ammonium chloride, and again boiled; a precipitate denotes the presence of pyrogallol-tannin (non-phlobatannin). In the absence of a precipitate, any phlobatannin present may be precipitated by boil-

ing the liquid with slight excess of ammonia solution. Such precipitate may be due to an anthoxanthin or to a mixture of this with phlobatannin, but the presence of the latter may readily be confirmed by the formaldehyde and hydrochloric acid test (*loc. cit.*). By means of these two tests the presence of phlobatannins alone, or pyrogallol-tannins alone, or both together, may be determined. (2) Five cc. of the extractive are boiled with 1.5 grm. of sodium dihydrogen phosphate and filtered, and the filtrate boiled with the ferric citrate solution. Unless in very small quantity, gallotannins are precipitated partially or completely as violet iron compounds, and ellagitannins as green-black compounds, whereas hamamelitannins give usually deep-brown solutions and only occasionally brown precipitates. Phlobatannins are not precipitated when boiled with ferric citrate solution, and are distinguished better by test (1) and by the formaldehyde reaction. Haematoxylin and the tannin associated with it in logwood give a brown solution when thus tested. A scheme, based on these tests and on that with Mitchell's reagent (ANALYST, 1925, 127), is given for the classification of bodies containing typical pyrogallol-tannins and no phlobatannins, and a table for the identification of 17 kinds is appended.—T. H. P. in the *Analyst*.

TEST FOR DIETHYL PHTHALATE.—Samuel Levinson (*Ind. and Eng. Chem.*, 1925, 17, 929), recommends the following procedure for the detection of the presence of diethyl phthalate in alcoholic liquids. A 10 cc. sample of the liquid is concentrated to a small volume by heating over a free flame; 1 gram of dry boric acid is added; and the liquid is evaporated to dryness. Then 1 gram of resorcinal is added; and the mass is heated until it becomes sticky and almost dry. After cooling, the mass is dissolved in 30 cc. of water with the aid of heat. The resulting solution is transferred to a tall glass cylinder, and is made alkaline by addition of sodium hydroxide. A fluorescence indicates the presence of diethyl phthalate.—*J. S. H.*

THE ULTRA X-RAY.—Discovery of ultra-X-rays a hundred times more penetrating than ordinary X-rays announced recently by Dr. R. A. Millikan, director of the Norman Bridge Laboratory of Physics of the California Institute of Technology, Pasadena, California, and winner of the Nobel prize for physics, is the climax of twenty years of search for the cause of a mysterious radiation. Two physicists,

Sir Ernest Rutherford and J. C. McClennan, noticed an unaccountable effect on their electro-scopes in 1903, and the Germans tried to determine its cause by high balloon ascensions just before the World War.

To account for the ultra X-rays, it is necessary to conceive that space is filled with rays of one sort or another traveling in all directions with the speed of light. This, Dr. Millikan says, is "a conception which is almost too powerful a stimulus to the imagination."

So far, Dr. Millikan has not proposed a name for the newly-described radiations, though some of his colleagues have suggested calling them "Millikan rays" in his honor. He gives them a purely descriptive name, "penetrating rays." Apparently they merit the title, for according to their discoverer they will pass through six feet of solid lead before they are extinguished, whereas the "hardest X-rays, up to the present the most penetrating radiations known, are stopped completely by half an inch of lead."

The wave-length of the "penetrating rays" is almost unimaginably short, being much less than the wave-lengths of the "hard" X-rays and of gamma rays from radium, the shortest vibrations at present familiar to physicists. The new rays fit on at the top of the known spectrum, and extend it into regions as yet unexplored. At the bottom of the spectrum are the very long waves of low-frequency alternating electric current, and in the zone above them the radio waves, with possible lengths of a mile or more. Then, with rapidly diminishing wave-lengths, come the infra-red heat rays, below the visible spectrum of light, then the light-waves themselves, passing out into the ultra-violet radiations above the spectrum. In this region the wave-lengths are short enough to stagger the average person's imagination—ordinary light waves, for example, average around one fifty-thousandths of an inch in length. Above the ultra-violet come the still shorter waves of the X-rays and the gamma rays of radium; and above these, completing the series so far as now known, the new "penetrating rays."

Where the rays come from is an unsolved mystery. They enter the highest atmosphere from the depths of outer space, being born apparently of the disintegration of atoms or of their transmutation into other elements. Dr. Millikan states that if sufficient energy for the transmutation of elements could be generated the process would bring forth penetrating rays as a by-product. But inasmuch as the immense energy of ten million volts or more would be necessary for this, he does not regard the prospect of human production of penetrating rays to be very promising.—*Science Service.*

SOLID EXTRACTS

UNTIL recently the cause of iron rust was not definitely known. The popular theory was that the iron united directly with oxygen, burning just as wood or coal, except more slowly. Now it has been definitely determined that electricity generated by the chemical action of water and air does the dirty work.

So the chemists proceed to take the air out of water in the local water systems. This can be done by boiling it, subjecting it to the action of a vacuum, or by running it through scrap iron, and the scrap-iron method is thought to be the cheapest. Here the water exhausts its destructive power on the scrap, with the result that it does little harm thereafter to the pipes through which it passes.

"Invisible Light" was the subject of Dr. Robert W. Wood, Professor of Experimental Physics at Johns Hopkins University. During the war, these invisible rays were employed in signal lamps for sending messages which could be seen only by observers using field glasses equipped with a special screen similar to that in the lamp. Unless the enemy possessed the same apparatus, they were invisible.

The same principles are now used in detecting forgeries and clever alterations of documents. The chemicals used in such frauds can be detected when they are illuminated by ultra-violet or infra-red rays. In cases of will or document forgeries, they will not only send for handwriting experts, but for chemists with ultra-violet-ray machines.

Photographs were made of Mars with filters which transmitted only the infra-red rays, and it was found that details on the surface of the planet were brought out which were quite invisible in pictures made with visible and with ultra-violet light. Further, the diameter of the planet in the infra-red pictures is appreciably less than in the others, so that astronomers have concluded that the presence of an atmosphere is indicated.

Cells isolated over ten years ago from the heart of an unhatched chick are still growing with undiminished vigor and now their bulk would have exceeded that of the sun had all these microscopic cells been allowed to grow and reproduce. This would indicate that the unit of life—the cell—is immortal when it lives in an environment where proper conditions of food supply and temperature are maintained and one in which its waste products are removed.

Dr. A. H. Ebeling of the Rockefeller Institute for Medical Research reports that these cells which have been kept on artificial food still reproduce a new cell exactly like themselves every forty-eight hours just as the original cell has done 1825 times before even though the life of the chicken is of much shorter duration than that length of time.

With man the problem of immortality is far more complex for here we find many millions of cells which require a variety of conditions for a favorable environment. If we may apply this discovery to man, it would be expected that any one of these millions of cells would be immortal

if left to itself under proper conditions. Prof. Raymond Pearl of Johns Hopkins University believes this to be the case and that man's mortality is caused by the inability of the cells to adjust themselves to their neighbors.

The best books may be a great source of danger if a careless tubercular person used them last, for Drs. Touchais and Moureau have found that the germs live on the pages for four or five months. The question is regarded as of practical importance because it shows the necessity of disinfecting books circulating in public schools or libraries.

Drs. Touchais and Moureau made tests to see how long the germs from tubercular sputum and from a laboratory culture kept their virulence when smeared on the pages of a large number of books kept in all sorts of conditions such as are found in homes, schools, and libraries. The germs from sputum were the hardiest and were able to infect guinea pigs with the disease even after four and a half months. The germs from the laboratory cultures were still active after two months, but in about three months they were impotent.

The missing chemical element number seventy-five has been discovered by Dr. J. Heyrovsky, professor of physical chemistry of Charles University, Prague, and Doctor Doleysek of the Prague Academy of Sciences, according to recent reports.

The element has been named bohemium, in honor of Bohemia, and was discovered as an impurity in the well-known metal magnesium through the use of the mercury drop electroscope.

Prof. Heyrovsky was a pupil of the famous English chemist, Ramsay, who discovered several elements, including argon.

Element seventy-five has heretofore been known only by its number or order in the table of elements arranged according to their atomic structure.

The discovery of element seventy-five has been previously claimed by Prof. Walter Naddack of the University of Berlin working with Otto Berg and Ida Tacke. They had named it rhenium.

Vitamin "C," the preventive of scurvy, has been obtained for the first time concentrated into crystalline form, by N. Bezssonoff, a biochemist. M. Bezssonoff obtained his product by the concentration of a large quantity of the juice of cabbages, which vegetables have long been recognized as effective in the prevention of scurvy. After the final treatment he had a quantity of colorless, needle-shaped crystals that had the same effect in the prevention and cure of the disease as is shown by fresh fruits and vegetables, even when given in the minutest amounts. Scurvy could be prevented in rats, his test animals, by daily doses as small as two milligrams, or less than one one-hundred-thousandth of an ounce. Chemical analysis of the crystals showed them to belong to the hydrocarbon group of organic substances; the compound has been given the technical name of "phenolic anthracene quinone."

A new and startling theory of how we got our good red blood is advanced by Mr. Needham of Cambridge. He suggests that the red corpuscles, now

a necessary factor in animal life, first entered as foreign invaders in search of food. Sometime back in the Pre-Cambrian, he surmises, when the ancestors of all mammals were still swimming in the sea and had not yet closed their circulatory system, they were penetrated by certain single and free-swimming cells, which, finding here abundance of nitrogenous nutriment, made themselves at home and in time became indispensable to their host. They swallowed the red coloring matter, a waste product which had been hard to get rid of, and used this as a medium for carrying fresh oxygen from the lungs to the muscles, so when the creature took to living on land it was able to make full use of the free air it found there.

Examination of more than a thousand samples of distilled liquors on sale in Massachusetts showed that more than nine per cent. contained poisonous copper salts in varying amounts. These results were revealed by Dr. Hermann C. Lythgoe, director of the Massachusetts Department of Public Health, and his collaborators, at the American Chemical Society meeting here recently. The experimenters studied the corrosive power of various kinds of fermented liquors distilled through a copper coil.

Dr. H. Leo, who has made a study of methyl alcohol poisoning, states that ordinary grain alcohol is more poisonous than wood alcohol to isolated cells and organs. The high toxicity of wood alcohol is due to certain chemical changes taking place in the alcohol after it is taken into the body. There it is changed into formic acid, and this is the substance that does the damage ascribed to the alcohol.

Dr. Leo tried out the effect of formic acid on dogs in the laboratory and found that the symptoms were identical with those of wood alcohol. The substance not only produces a dangerous state of acidosis, but acts as a direct poison. Large doses of sodium bicarbonate — common baking soda—had a markedly beneficial effect on the experimentally poisoned dogs.

Urging that greater care be taken of even trivial skin affections, Dr. A. Campagni in the Presse Medicale states that the skin may be the route taken by infection in pulmonary tuberculosis. Dr. Campagni found that about one-quarter of his pulmonary tuberculosis patients had obviously had skin affections such as boils, whereas in healthy individuals the frequency is only half that. In 67 per cent. of the cases, he noted that the lung disease was on the side that the skin disease had been on.

Soap has a value as an aid to health even greater and more direct than has hitherto been suspected. The ordinary routine of dishwashing and laundering or cleaning the face and hands is fatal to germs of such dangerous diseases as pneumonia, diphtheria, blood poisoning and other serious infections. Dr. John E. Walker of the Service Laboratory of the Army and Navy General Hospital here, has recently concluded extensive experiments which showed that common soaps were effective germicides in at least three types of infections, while soap made with coconut oil was markedly destructive to the organisms of typhoid fever.

The soap in greatest use around hospitals is the "official soft soap." The substitution of coconut oil for the linseed oil used in making this soap, Dr. Walker said, would render it germicidal against the typhoid bacillus as well as against the other three organisms. Although this change would make the soap more irritating to the skin, the change would be desirable, and it would be useful in case of typhoid epidemics.

BOOK REVIEWS

THE CHEMICAL ACTION OF ULTRAVIOLET RAYS. By Carleton Ellis and Alfred A. Wells, assisted by Norris Boehmer. 362 pages, 85 illustrations, 8vo. The Chemical Catalog Co., New York.

At the outset, the reviewer wishes to express approval of the sensible manner in which the publishing company has paged this book. The absurd system, so common in scientific works, of having a series of pages in Roman numerals has been eliminated, and page 1 is really the first page (title) of the book. In other features, also, the book is well made.

The matter of the book is of a highly interesting and important nature. The rays of "invisible light" are being studied with much care of late years, most attention being given to those which, according to the commonly received theory, are shorter and faster than those visible to human eyes. The infrared, longer and slower than the visible ones, have received comparatively little attention. Dr. Wood, some years ago, showed some striking phenomena concerning them, among other facts, that many green leaves reflect notable amounts of the rays, so that if screens are used cutting off the visible spectrum, a brilliant illumination of the leaves is obtained in a photograph, giving the appearance of a tree covered with snow.

The book in hand is a very thorough treatment of the chemical effects of ultraviolet light of wave length below the X-ray, discussing the method of obtaining them, the applications to sterilization, therapeutics and photosynthesis and their injurious action on the skin. Concerning this last, the authors are not alarmists, asserting that owing to the low penetrating power of the rays commonly employed, the injury to human tissue is superficial. The X-rays, on the other

hand, which are also of the invisible (ultraviolet) type, have great penetrating power and can produce deep-seated injury.

Some of the data set forth in this work are included in an editorial notice in this JOURNAL, and need not be repeated at length here. Much enthusiasm has developed of late years concerning the therapeutic actions of the rays and hopes for cures for some diseases that have resisted other means have been raised. It is, however, by no means certain that all may be attained that is suggested. There seems to be little doubt that our ordinary methods of indoor illumination by glass in the daytime, electric bulbs or gas in the night, have much less healthful influence than sunlight and light from the open sky. This is, indeed, a matter of common experience, but experiments lately reported have emphasized the value of outdoor illumination, having indicated that animals upon a defective diet can be protected from the effects of such diet by exposure to sunlight. Incidentally, the book informs us that the ultraviolet light from the sun does not reach the earth in appreciable amount, the supply coming principally from the open sky. Considerable space has been given to the apparatus and results of sterilization by ultraviolet rays, among which has been the sterilization of water for drinking purposes and the sterilization of swimming pools. It is stated that of late years these applications have been on the decline. A difficulty in the use of the rays is their very low penetrating power. They pass through very few substances. Few of the common transparent materials, such as glass, mica, celluloid and water, transmit appreciable amounts. Some forms of cellulose fabric, not nitro- or aceto-products, transmit a small portion, but quartz and fluorite are the most satisfactory media. Glass of special composition is now in the market which transmits considerable amounts of the rays and cuts out most others, so that fairly pure beams of ultraviolet light can be obtained. The uviol glass of Zeiss Works and a glass recently brought out by the Corning Works are of this type.

This book is to be strongly recommended as a careful compilation of an immense amount of information scattered through many publications, relating to one of the most interesting and peculiar phases of physical phenomena.

HENRY LEFFMANN.

CHEMISTRY IN INDUSTRY, VOL. II. Edited by H. E. Howe and published by The Chemical Foundation, Inc., New York City. 392 pages, many illustrations. Cloth-bound, $1.00.

The title of the work is most fortunate, since it fully describes the plan and the purpose of the book.

Chemistry *is* in industry and it is there to stay. It is revolutionizing industry in many respects. But not everyone cares for revolutions, hence the porcupiny objections of some myopic industries to the advent of chemistry into their specific field. Witness the reaction of certain interested parties in the baking industry to the chemist and his laboratory as adjuncts in the flour milling fields. (*Jour. Ind. Eng. Chem.*, Dec., 1925, p. 1214.)

Somehow or another there has crept into the word "Chemicals" a most sinister meaning and it is not rare for good people to be unable to clearly see how "chemicals and chemists" can possibly harmonize with the food industries.

Along this and many other lines is need of much more education and such books as "Chemistry in Industry" furnish excellent media for that purpose.

The scope of the second volume may be judged from the table of contents, which is as follows:

CATALYSIS—A NEW FACTOR IN INDUSTRY. By Ellwood Hendrick, *Curator*, Chandler Chemical Museum, Columbia University.

THE CHEMIST'S CONTRIBUTION TO AVIATION. By C. W. Seibel, Helium Division, Bureau of Mines.

CASEIN—A WASTE OF ONE INDUSTRY MADE THE RAW MATERIAL OF MANY OTHERS. By Geo. H. Brother, *Operating Manager*, Karolith Corporation.

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SOAP—CLEANLINESS THROUGH CHEMISTRY. By Martin Hill Ittner, *Chief Chemist,* Colgate & Company.

THE RELATION OF CHEMISTRY TO WATER SUPPLIES. By W. W. Skinner, *Assistant Chief,* Bureau of Chemistry.

Rarely is one given the opportunity to secure for a nominal price, a book which is as instructive and interesting as "Chemistry in Industry."

IVOR GRIFFITH.

INDEX TO VOLUME 97 OF THE AMERICAN JOURNAL OF PHARMACY

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SUBJECTS

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